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ABSTRACT

The Intermediate Form of the Educational Quality Assessment Inventory (EQUI) for grades 7 and 9 is designed to provide Commonwealth schools with reliable information about student development in each of the 10 education goals. The EQAI measures the students' attitudes, values, beliefs, habits and basic cognitive skills. This manual, organized in four sections, gives insight into the technical properties of the EQAI scales. The first section highlights the procedures and techniques used to construct and field-test the assessment instruments and gives an overview of the total inventory. Section two discusses the 10 quality education goals and the measurement devices associated with each. Included in this section are the goal and measurement rationales, scale and subscale descriptions, scoring procedures, reliability and validity findings for each instrument. Section three offers a series of tables which isolate specific student target groups that might benefit the most from programs designed to facilitate growth in each goal area. Section four discusses additional properties of the battery and summarizes the interrelationship between all scales and subscales. For related articles see TM 003 395 and TM 003 396. (Author/MLP)

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EQA Inventory Technical Manual

Grades 7 and 9

by Nolan F Russell, Research Associate
Division of Educational Quality Assessment
Bureau of Planning and Evaluation
Pennsylvania Department of Education
1973

Commonwealth of Pennsylvania
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FOREWORD

It is generally assumed that the process of assessing educational attainment of students is a relatively recent phenomenon. This is not the case. Surprisingly, assessment has roots leading as far back as 2000 B.C. During the reign of the Shun Dynasty in China, students spent years preparing to take the extensive series of tests leading to positions in civil service. In the Middle Ages, Jesuit monks developed an elaborate program to evaluate the educational progress of novices entering the order.

The seeds of assessment in American education germinated in the 1860s. One of the first directives given to the U.S. Office of Education, founded in 1867, was *"to determine the progress of education."* However, student assessment was to play a minor role in public education until the turn of the century.

Renewed interest in assessment in America came about as a result of the work of Simon and Binet who in 1905 were commissioned by the Paris Ministry of Public Instruction to *"develop a test which could identify those children likely to fail in school."* It was planned that these children would be placed in special classes before losing too much ground or becoming discouraged. Simon and Binet's Metric Scale of Intelligence worked quite well and was quickly adapted to test public school children in the United States. In the period following the development of this scale other individual and group tests became available.

These early tests had two traits in common. Initially, their express purpose was to select or weed out individuals rather than evaluate the progress of the total program offered to students. Further, the vast majority of tests concerned themselves solely with those skills in the cognitive domain, such as the 3 R's.

These tests proved fairly satisfactory because they were tied to a very narrow conceptualization of the school's role in society, namely, the imparting of knowledge associated with the traditional academic disciplines. As society developed broader expectations of the school in regard to its responsibilities for educating the *"whole child,"* an increasing emphasis was placed on the affective development of students–their social and emotional growth.

Changing beliefs concerning what schools are all about, increasing sophistication in computer technology and society's increasing demand to evaluate school programs have led to a proliferation of wide-scale assessment programs.

Pennsylvania's Educational Quality Assessment program is one of these. Assessing affective as well as cognitive growth of students, it represents an attempt to give Commonwealth schools valid and reliable information concerning the effectiveness of their overall educational programs and to identify areas in which additional programs would be fruitful.

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INTRODUCTION

The Intermediate Form of the Educational Quality Assessment Inventory (EQAI) for grades 7 and 9 is designed to provide Commonwealth schools with meaningful and reliable information about student development in each of the 10 state adopted quality education goals. The EQAI can be characterized as a collection of structured, paper-and-pencil measurement devices purporting to appraise those diverse psychological constructs such as attitudes, values, beliefs, habits and basic cognitive skills thought to be important in becoming a well-rounded, functioning young citizen in today's world.

Clearly, paper-and-pencil devices represent an efficient and economic method for providing information concerning student attitudes and skills. However, results gleaned from these measures are subject to many and varied misinterpretations.

To make maximum use of the information offered by the EQAI one must know where the tests come from, what they really measure, how accurately and reliably they measure it, what scores on the tests mean, how acceptable scores are determined and how much influence faking and response bias have on the final results.

This manual, organized in four sections, gives insight into these and other technical properties of the EQAI scales. The first section highlights the procedures and techniques used to construct and field-test the assessment instruments and gives an overview of the total inventory. Section two discusses the 10 quality education goals and the measurement devices associated with each. Included in this section are the goal and measurement rationales, scale and subscale descriptions, scoring procedures employed, and reliability and validity findings for each instrument. Section three offers a series of tables which isolate specific student target groups that might benefit the most from programs designed to facilitate growth in each goal area. Section four discusses additional properties of the battery and summarizes the interrelationship between all scales and subscales. The technical and statistical terms used in this manual are defined in the Appendix.

SECTION ONE

History and Development

Attitudes and Their Measurement

Attitudes, beliefs, values, etc., are abstractions–nevertheless they are real enough to the individual who holds them. They are typically thought of as a state of readiness, a predisposition to act or react in a certain way when faced with certain situations. Thus the person's attitudes are present but dormant most of the time. They are expressed in speech or other behavior only when the object of the attitude is perceived. A person may have strong attitudes for or against astrology but they are actively expressed only when some issue connected with astrology arises - or when confronted by an attitude scale! Attitudes are often reinforced by beliefs (the cognitive component) and attract strong feelings (the emotional component) that will lead to particular behaviors (the action tendency component).

The measurement of attitudes always involves making inferences. Since the attitudes cannot be seen or measured directly, we must infer their presence from consistencies that appear in the individual's behavior. Observing individuals across time in everyday situations is probably the best way to get a handle on how the individual thinks, feels and acts.

Clearly, this method is much too cumbersome and costly when we want to investigate the intensity and direction of attitudes for a large number of people, forcing us to rely instead on verbal reports of the individuals concerned.

Testing the Tests

The use of paper-and-pencil scales requires several assumptions: (a) individuals will respond with consistency to questions that are asked and will state fairly stable preferences that reveal underlying attitudes, (b) they will refrain from deliberately choosing responses so as to make themselves look good and answer as honestly as possible and (c) the questions themselves will be realistic in terms of the attitude of concern.

In order to insure that the scales included in the EQAI meet the above assumptions as closely as possible, each scale is taken through an extensive series of field trials and revisions. This philosophy of *"testing the tests before using them to test people"* resulted in a three-year developmental period requiring strong cooperation between the Department of Education and over 100 Commonwealth school districts.

After completing the tasks of operationally defining each goal area to be measured, developing measurement rationales consistent with these definitions, and constructing pools of items to be included in each scale, the instruments were organized into a large experimental battery.

Phase I Field Trial

During October 1971 this battery was field-tested using approximately 2,800 7th grade students drawn from 91 schools. Located at each testing site was a monitor who had been trained by department personnel to control testing procedures and to record student reactions to each scale in special log booklets. A sample log is presented below.

EXAMPLE

MONITOR'S LOG:

TIME:

Section Started————80% had completed————Section Terminated————

DESCRIPTION OF SECTION

	Poor	Adequate		Good
	1	2	3	4
DIRECTIONS	( )	( )	( )	( )
ITEM SENTENCE STRUCTURE	( )	( )	( )	( )
VOCABULARY LEVEL	( )	( )	( )	( )
TIME ALLOWED	( )	( )	( )	( )

DESCRIPTION OF STUDENTS

	1	2	3	4	
BORED	( )	( )	( )	( )	EAGER
CONFUSED	( )	( )	( )	( )	CLEAR
CARELESS	( )	( )	( )	( )	CAREFUL
DISTRACTED	( )	( )	( )	( )	CONCENTRATING

If answer is yes to any of below questions: explain on back of this sheet.

1) Were you forced to deviate from directions? (Y) (N)

2) Did students have difficulty marking answer sheet properly? (Y) (N)

3) Were there any words students had major difficulty understanding? (If yes, circle words and items in Questionnaire) (Y) (N)

List number of each student whose performance might invalidate his or her score on this section. Reasons include student (a) staring into space and not completing section, (b) copying answers and (c) marking answers without referring to questionnaire booklet.

NUMBER	REASON
1.	
2.	
3.	
4.	
5.	
6.	

These *"Monitor Logs"* were designed to evaluate the following specific properties of the experimental measuring devices.

> The understandability of directions and task requirements associated with each scale.
>
> The difficulty of vocabulary and/or phrases used in each item.
>
> The perceived relevance of response choices for each item and scale.

Analysis of monitor-reported student reactions led to major changes in approximately one-third of the scales and minor changes in all the scales. In addition, the logs were used to answer the following questions associated with the total-test battery.

> How quickly do students get bored and become careless during the testing period?
>
> Is there a relationship between scale scores and the emotional climate expressed by the group when completing the scales?
>
> Is there a relationship between scale scores and testing conditions (i.e. lighting, distractions, etc.)?

An index of emotional climate was constructed by adding scores on the bipolar student description check list (see *"Monitor's Log"*– Description of Students). Analysis of these scores revealed a statistically significant decrement in the first session. At the outset of the second session, the emotional climate was at a level comparable to what it was in the beginning of the first session. However, it again showed a significant decline across the second session.

Scores on scales given during the latter half of each session were correlated with emotional climate. Although all correlations were slightly positive, none was statistically significant.

Finally, 30 school groups who had experienced some adverse testing conditions in terms of settings, distraction, etc., were compared to the remaining 61 groups who experienced little or no adversity on each of the scales with the use of independent t-tests. While the majority of comparisons gave slight advantages (in terms of obtained scores) to the no adversity group, none of the comparisons resulted in statistically significant t's. These results led to the conclusion that when testing conditions are fairly well controlled by trained monitors, the scales were not highly influenced by emotional climate and testing conditions.

Concurrent with scale evaluations using data gathered from test monitors, various statistical analyses were performed on data gathered from the 2,800 students in order to answer these questions:

> How unidimensional or homogeneous is the group of items comprising each scale, i.e., do items within the scale hang together?
>
> Which items within each scale discriminate best between students and groups of students?
>
> How do items/scales within the battery relate to one another?

A Likert-type item-analysis was conducted for each scale. This technique incorporates correlating scores on each item with the total score of the instrument after removing that particular item's contribution to the total score. Then, after isolating the top and bottom 27 per cent of the scores on the total test, t-tests are performed between the two groups on each item within the scale. By examining the results of these two procedures one can determine the degree of interrelationship between each item and the total scale score while at the same time identify those items which most efficiently separate the high and low scoring groups. Two such analyses were performed on data from each instrument – one using individuals as units of analysis and one using group scores as units of analysis.

Those items failing to correlate with the total scores ($r < .25$) and/or failing to discriminate between the high and low groups ($t < 1.96$) were removed from the scale or revised.

Also computed for each measurement device was the coefficient alpha, an index of internal consistency reliability. This index takes into account the number of items within the scale and the average intercorrelation of the items. Ranging in value from 0.00 through 1.00, this index describes the proportion of *"true"* variance within the test as opposed to *"error"* variance. The reliability and item-analysis results led to revisions in every scale and removal of two scales from the battery.

A final analysis was conducted to determine whether the tendency of students to make socially desirable answers was related to obtaining higher scores on any of the scales. Inserted into the battery was a special 36-item scale containing questions such as *"I have never been angry at anybody"* and *"No matter who I'm talking to, I'm always a good listener."* This scale was designed to measure the tendency to make socially desirable responses. Scores on this instrument were correlated with scores on all other items and instruments. Those items and scales whose scores were found to be associated with socially desirable responding were deleted or revised to minimize the relationships found.

Developing Subscales

Instrument revision and new scale development were completed by April 1972. At this juncture efforts were directed at organizing the items to produce meaningful and reliable subscales for each instrument.

In May 1972 short test booklets were constructed which contained three or four instruments. Each booklet was administered to approximately 300 9th grade students drawn equally from rural, suburban and inner-city settings. Analytic procedures similar to those used on 7th grade data were again employed. In addition, efforts were made to evaluate the technical characteristics of each subscale.

Because item assignments to subscales were made on a rational basis, i.e. by grouping items according to their face content, it was necessary to develop empirical criteria for item placement into subscales.

The criterion regarding items was: For an item to remain in the subscale it must correlate more highly with its particular subscale score (its contribution to the subscale score having been removed) than with any other subscale or total scale score.

The subscales themselves had to meet two criteria before being finalized. First, the intercorrelations between subscale scores could not exceed .70. This criterion was developed to insure that information provided by the subscales would not be redundant to the information provided by the total scale scores.

Second, the internal consistency reliability for each subscale had to be greater than .60. This criterion provided another safeguard that the subscales were homogeneous.

When a subscale did not meet these criteria, the subscale was deleted and its items were either reassigned to the remaining subscales or deleted. The revised subscales were again subjected to all of the above criteria. This process was continued until all items and subscales met the criteria.

Scoring of the Scales and Subscales

In order to give school personnel a clearer picture about the performance of their students on the EQAI, two scoring methods were developed for each attitude scale. The first scoring method organizes the response options within each scale into a hierarchy. Different scoring weights are then applied to each level of the hierarchy. Consequently, for an item such as *"I like school"* with response options (a) strongly disagree, (b) disagree, (c) agree and (d) strongly agree, weights of one through four are applied respectively to each answer choice. This method is based on the assumption that *"strongly agreeing"* with a statement is more positive than merely *"agreeing"* with the statement.

Item scores obtained by this method are summed and used to generate norm-referenced information about student performance. How well a group of students perform on the scales is determined by the relationship of their scores to other student groups. This *"norm-performance"* tells us little about how favorable or unfavorable the student scores are.

To obtain information about favorable and unfavorable responding, a criterion-referenced scheme is used. This scoring method is based on the notion that each item within the scale offers the respondent the chance to show a positive or negative attitude toward the specific content presented by the scale item. Hence, the response choice to the above item is scored by assigning a one to the *"strongly agree"* and *"agree"* choices and a zero to the remaining choices.

The number of positive responses given by each student is obtained. This count is compared to an independently determined *"standard"* or *"criterion."* If the number of favorable responses meets or exceeds the standard, the student is said to have *"achieved"* the standard. In the case of scales used in the EQAI, three criteria were set. The first, required students to respond favorably to more than 35 per cent of the items; the second, required favorable responses to more than 50

per cent of the items and the third required favorable responses to more than 70 per cent of the items.

Validity

Validity has typically been defined as the quality of measurement which answers questions relating to the degree the test measures what it is intended to measure and nothing else. Various types of validity include:

1. *Content validity* - Can informed readers agree that the test content is appropriste for the construct the test purports to measure?

2. *Criterion validity* - Can scores on the test predict what students will do outside the testing situation or discriminate between two or more groups of students who are known to have different characteristics?

3. *Construct validity* - Are the test scores related with other variables in predictable ways?

All EQAI scales have content validity. Their contents were *"validated"* according to the rationales developed for each of the 10 goals of EQA staff members, measurement researchers and school personnel. Several of the EQAI scales were subjected to criterion related validity studies. Descriptions of these studies are included in Section Two. The subscales and composite scales were subjected to a factor analysis to give some indication of their construct validity. These results are reported in Section Four of this manual.

Overview of the EQAI

The EQAI contains 458 items comprising 14 composite scales. Twelve instruments are directly related to measurement of students' achievement in the 10 quality education goal areas. The remaining two are special scales designed to measure students' perception of (a) the atmosphere of home life (Home Climate) and (b) their tendency to respond to items in a manner which will place them in a favorable light (Social Desirability).

The EQAI is specifically designed for assessment at grades 7 and 9. Identical scales are used for each of these grade levels except for the basic skills area, i.e. math and verbal skills.

The normative base for the EQAI was formed by statewide testing in March 1973. The normative group for grade 7 included approximately 15,000 7th grade students who were enrolled in 62 Commonwealth middle schools (5-8, 6-8, 5-7 buildings with approved programs as of October 1971). The 9th grade sample included about 25,000 9th grade students who were enrolled in 114 Commonwealth schools having a grade structure of 7-9 or 7-12. For further clarification regarding the normative sample see *"Manual for Interpreting Intermediate School Reports."*

SECTION TWO

Rationale and Measurement

This section discusses each of the 10 quality education goals and the measurement rationales used to assess specific components of each goal and describes in detail each of the goal related scales. Information is also presented on technical properties of each scale. Brief definitions of the technical terms used in this section can be found in the Appendix.

The statistical characteristics shown for each scale are based upon analyses using two subsamples of individual student data gathered from the 1973 normative samples. The subsamples were derived by randomly selecting one-fifth of the 7th grade students tested and one-seventh of the 9th grade students tested.

The 7th grade student subsample is comprised of 2,886 students – 25 per cent coming from rural homes, 26 per cent from homes in small towns (less than 10,000 people), 43 per cent from suburban homes and about 6 per cent from urban homes.

About 49 per cent are girls, 93 per cent are white, 3 per cent are black and 4 per cent are other races. About 26 per cent of the 7th grade students report having moved in the past three years.

The grade 9 subsample has 3,018 students. It contains 18 per cent rural students, 32 per cent from small towns, 29 per cent living in suburban and 21 per cent living in urban areas. Of the urban group, however, less than 1 per cent live inside a city of more than 100,000 people.

The grade 9 subsample splits exactly 50-50 on sex. Four per cent of the grade 9 sample are black, 92 per cent are white and 4 per cent are other races. Sixteen per cent of the 9th grade students report having moved in the past three years.

GOAL I: SELF-ESTEEM

Goal Statement

Quality education should help every child acquire the greatest possible understanding of himself and an appreciation of his worthiness as a member of society.

Goal Rationale

It is widely held that self-understanding is significantly associated with personal satisfaction and with effective functioning. The views which students have of their adequacies and their inadequacies and of their values and their desires can strongly influence their performance in school.

Regardless of the level and pattern of each student's particular talents, the school experience should strengthen, not damage, each child's self-esteem. The school should be operated in such a way that children at all levels of talent can achieve a growing awareness of their worth as persons in a society that claims to have an equality of concern for all its members.

Measurement Rationale

Self-esteem is a personal judgment of worthiness, a subjective experience which the individual conveys to others by verbal reports and other overt expressive behaviors. Most theories acknowledge the fact that our self-image and feelings of worthiness are determined to a large extent by the degree to which we are able to live up to our own aspirations and to meet certain expectations held by others.

Viewed in this way aspirations become closely associated with personal goal setting behavior originating in our internalized system of values, while expectations are external in nature and are related to goals set collectively by society or by significant individuals in our lives. Assessment in this area is based on four constructs believed to be related to the development of positive self-esteem.

The first has to do with locus of control – whether one views personal success as dependent upon one's own efforts or due to external influences. Externally controlled individuals will tend to be more dependent on others and be more willing to ride with the tide, accepting docilely, things which happen to them. Internal individuals will be more active in attempting to control self-destiny.

The second related concept is self-confidence – the feeling of self-worth and the belief that one is capable of handling things successfully. Those who lack self-confidence are often characterized as being timid, cautious, submissive individuals who feel inadequate, fearful, inferior and expect to be unsuccessful in dealing with new situations.

The third concept is image in school settings. Those having favorable self-images are likely to experience subjective success with schoolwork, feel that they are favorably viewed and understood by teachers and enjoy class participation.

The final dimension involves the students' views of the quality of their relationships with others. Individuals who have difficulty in interpersonal relations will tend to hold the belief that others have little confidence in them or hold them in low regard.

General Scale Description*

The self-esteem scale is comprised of 36 short, self-description statements. Ten are positively worded – describing the student in a favorable light and 26 are negatively worded – characterizing the student in a negative vein.

Sample positively worded item: *"I'm easy to get along with."*

Sample negatively worded item: *"Things are all mixed up in my life."* Response options available to the students are: (1) very much like me, (2) usually like me, (3) usually unlike me and (4) very much unlike me.

The items within the scale are grouped in such a way as to yield four subscale scores in addition to a total scale score.

Subscale 1:

Self-confidence contains 10 items measuring feelings of success, self-determination, attractiveness and self-worth. Sample item: *"I'm pretty sure of myself."*

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*The self-esteem scale is a result of extensive revision of the Goal I instrument which was used for grades 5 and 11. Richard L. Kohr and Nolan F. Russell from the Division of Educational Quality Assessment were responsible for the revisions.

Subscale 2

Feelings of control over environment contains eight items tapping belief that success in school and work depend on effort, not luck. Sample item: *"My getting good grades in school depends more on how the teacher feels about me than on how well I can do my work."*

Subscale 3

Relationships with others contains eight items assessing the student's perceived ease in making and keeping friends and the student's feelings of acceptance by others. Sample item: *"I often feel picked on by other kids."*

Subscale 4

Self-image in school comprises 10 items designed to measure feelings of success in schoolwork, class recitation and teacher relationships. Sample item: *"In class, I often feel 'put down' by teachers."*

Norm-Referenced Scoring

For norm-referenced scoring the item weighting scheme used is:

	Response Options			
Item Direction	Very Much Like Me	Usually Like Me	Usually Unlike Me	Very Much Unlike Me
Plus	3	2	1	0
Minus	0	1	2	3

Criterion-Referenced Scoring

Responses are considered *"favorable"* if they reflect a positive self-image. An individual's score on a given scale (total or subscale) is the percentage of items to which a favorable response was given. For the self-esteem instrument the scoring scheme applied to the items is:

	Response Choices			
Item Direction	Very Much Like Me	Usually Like Me	Usually Unlike Me	Very Much Unlike Me
Plus	1	1	0	0
Minus	0	0	1	1

Each student's score is then compared to a standard having three levels. To meet level one the student must respond favorably to at least 35 per cent of the items. To meet level two the student must respond favorably to at least 51 per cent of the items. Level three requires students to choose favorable response choices to at least 70 per cent of the items.

Technical Properties

The self-esteem scale has a reading difficulty level of grade 4.9 (based on Gunning - Fog Readability Formula). Reliability estimates were obtained separately for low achievement, average achievement and high achievement students (defined by scores on composite math-verbal scale), in order to determine its appropriateness for students of differing reading abilities. The resulting coefficient alphas across the three groups in grade 7 were .79, .87 and .90. At grade 9 they were found to be .82, .88 and .90.

Selected norm-referenced characteristics of the instrument based on the total grade 7 subsample are presented in Table 1. Table 2 gives the same information relative to the grade 9 subsample. Tables 3 and 4 show the intercorrelations between subscales at each grade. Table 5 gives the reliability estimates obtained through criterion-referenced scoring and shows the proportion of students meeting each criterion level.

TABLE 1

SELECTED TECHNICAL CHARACTERISTICS OF GOAL I:
SELF-ESTEEM SCALE (GRADE 7)

TECHNICAL CHARACTERISTIC	SUBSCALE NAME				
	Self-Confidence	Control over Environment	Relationships with Others	Self-Image in School	Total Scale
Number of Items	10	8	8	10	36
Mean	16.76	15.06	13. 95	16.04	61.80
Standard Deviation	5.10	3.73	3.98	4.96	13.90
Skewness	-.21	.02	-.22	-.05	.08
Kurtosis	-.13	-.15	.27	.08	.17
Guttman's LAMBDA-3 Reliability	.78	.65	.77	.77	.89
Coefficient Alpha Reliability	.74	.58	.71	.72	.87
Standard Error of Measurement	2.61	2.42	2.16	2.03	5.07
Averave Inter-Item Correlation	.22	.15	.23	.20	.15
Average Item Mean	1.68	1.88	1.74	1.60	1.72

NOTE: Based on subsample of 2,886 7th grade students.

TABLE 2

SELECTED TECHNICAL CHARACTERISTICS OF GOAL I:
SELF-ESTEEM SCALE (GRADE 9)

TECHNICAL CHARACTERISTIC	SUBSCALE NAME				
	Self-Confidence	Control over Environment	Relationships with Others	Self-Image in School	Total Scale
Number of Items	10	8	8	10	36
Mean	16.97	15.39	14.11	15.78	62.26
Standard Deviation	4.93	3.70	3.85	4.79	13.56
Skewness	-0.21	- .08	-.26	-.08	.01
Kurtosis	-0.03	-.12	.39	.16	.22
Guttman's LAMBDA-3 Reliability	.79	.71	.80	.79	.90
Coefficient Alpha Reliability	.74	.64	.73	.73	.88
Standard Error of Measurement	2.50	2.22	1.98	2.48	4.76
Average Inter-Item Correlation	.22	.18	.26	.22	.17
Average Item Mean	1.70	1.92	1.76	1.58	1.73

NOTE: Based on subsample of 3,014 9th grade students.

TABLE 3

CORRELATION MATRIX BETWEEN SUBSCALES
FOR SELF-ESTEEM SCALE: GRADE 7

	SUBSCALE NAME		
Subscale Name	Self-Confidence	Control over Environment	Relationships with Others
Control over Environment	.52		
Relationships with Others	.51	.37	
Self-Image in School	.53	.51	.40

TABLE 4

CORRELATION MATRIX BETWEEN SUBSCALES
FOR SELF-ESTEEM SCALE: GRADE 9

	SUBSCALE NAME		
Subscale Name	Self-Confidence	Control over Environment	Relationships with Others
Control over Environment	.50		
Relationships with Others	.54	.35	
Self-Image in School	.54	.48	.45

TABLE 5

CRITERION-REFERENCED RELIABILITY AND PROPORTION OF STUDENTS EXCEEDING EACH OF THREE CRITERION LEVELS: SELF-ESTEEM (GRADES 7 AND 9)

		CRITERION LEVELS					
		Level One		Level Two		Level Three	
GRADE	SUBSCALE NAME	Prop. Passing	Reliability	Prop. Passing	Reliability	Prop. Passing	Reliability
7	Self-Confidence	.82	.85	.59	.68	.44	.75
7	Control over Environment	.95	.94	.72	.57	.54	.55
7	Relationships with Others	.90	.92	.64	.66	.47	.73
7	Self-Image in School	.80	.83	.55	.69	.41	.77
7	Total Scale	.94	.97	.71	.88	.35	.88
9	Self-Confidence	.84	.87	.61	.69	.47	.73
9	Control over Environment	.96	.98	.76	.67	.61	.57
9	Relationships with Others	.90	.95	.68	.69	.51	.72
9	Self-Image in School	.80	.83	.54	.70	.41	.78
9	Total Scale	.94	.97	.73	.90	.39	.88

GOAL II: UNDERSTANDING OTHERS

Goal Statement

Quality education should help every child acquire understanding and appreciation of persons belonging to social, cultural and ethnic groups different from his own.

Goal Rationale

The students fulfilling the requirements of Goal II will more likely enjoy an easy interaction with *all* people – speaking to and selecting as friends students of different origins and beliefs. They will be more willing to actively seek information or participation in activities which will increase their knowledge about other cultures and social settings.

The school experiences should help students learn to respect and achieve an easy interaction with children who differ from them in various aspects (e.g., skin color, cultural traditions, economic status, religious beliefs, physical abilities, manner of speech and degree of intellectual competence).

Measurement Rationale

The processes and determinants of interpersonal interaction are complex, involving a myriad of perceptual, feeling and behavior responses.

The notion of tolerance toward others has meant a variety of things to various theorists. Some define tolerance in terms of the *"social distance"* individuals keep between themselves and differing others. Others use tolerance to describe the tendency of individuals to make stereotypical prejudgment or to take actions toward differing others based solely on the differing others' group membership.

The assessment of this goal area is based on still another component of tolerance. This component is the degree of comfort experienced by individuals when finding themselves in contact with differing others.

General Scale Description*

Items describe situations where differing others interact with the individual. Differences are in terms of racial, religious and social background or physical and mental attributes. Twenty-four items suggest an approach toward the student, e.g., *"A cripple wants you to become a close friend."* Nine items suggest an avoidance of the student, e.g.,*"A girl with a bad limp avoids you because she thinks you might make fun of her."* Response choices are *"I would feel"* (1) very uncomfortable, (2)uncomfortable, (3) comfortable and (4) very comfortable.

The items within the scale are grouped in such a way as to yield five subscale scores in addition to a total scale score. Assignment to subscales is based upon the characteristic of the hypothetical target person that makes the target person *"different"* from the respondent. The five subscales are race, religion, socioeconomic status, intelligence and handicap. The religion and handicap subscales each contain six items while the remaining subscales contain seven items apiece.

Norm-Referenced Scoring

For norm-referenced scoring, the item weighting scheme is:

	Response Options			
Item Direction	Very Comfortable	Comfortable	Uncomfortable	Very Uncomfortable
Plus	3	2	1	0
Minus	0	1	2	3

Criterion-Referenced Scoring

Responses are considered *"favorable"* if they reflect comfort when interacting with differing others or discomfort when being shunned by differing others. An individual's score on a given scale (total or subscale) is the percentage of items to which a favorable response was given. For the tolerance toward others instrument the scoring scheme for items is:

*The tolerance toward others instrument was developed by Eugene W. Skiffington and Nolan F. Russell from the Division of Educational Quality Assessment and Peggy L. Stank and Tom McGinnis from the Division of Research.

Item Dir.	Response Choices: Very Comfortable	Comfortable	Uncomfortable	Very Uncomfortable
Plus	1	1	0	0
Minus	0	0	1	1

Each student's score is then compared to a standard having three levels. To meet level one the student must respond favorably to more than 35 per cent of the items. To meet level two the student must respond favorably to more than 51 per cent of the items. Level three requires students to choose favorable response choices to more than 70 per cent of the items.

Technical Properties

The tolerance toward others scale has a reading difficulty level of grade 5.0. To obtain a clearer picture about the appropriateness of the total scale across students differing in ability, both the grade 7 and 9 subsamples were split into three smaller groups (low achievement, average achievement and high achievement). Internal consistency reliability estimates across these groups were found to be .71, .81 and .86 at grade 7 and .30, .84 and .87 at grade 9.

Tables 6 and 7 list selected scale characteristics based on the total student subsamples. Note that the subscales socioeconomic status and intelligence show low reliabilities at both grade levels. Caution is suggested when interpreting scores on these two subscales. Tables 8 and 9 show the intercorrelations between subscales. Table 10 gives the reliability estimates obtained through criterion-referenced scoring and shows the proportion of students meeting each criterion level.

Validity

In an independent study a longer version of this instrument discriminated between those 7th grade students choosing others different from themselves in racial characteristics as friends from those students refusing to do so.

Another indication of this scale's validity comes from the March 1973 test results. One school district which participated in the assessment had a recent history of racial tension causing schools to close on several occasions. Only 46 per cent of their grade 9 population exceeded the criterion of making favorable responses to more than one-half of the items contained in the race subscale. Of the 25,000 grade 9 students tested across the Commonwealth, 73 per cent met this particular criterion.

TABLE 6

SELECTED TECHNICAL CHARACTERISTICS OF GOAL II:
TOLERANCE TOWARD OTHERS SCALE (GRADE 7)

TECHNICAL CHARACTERISTIC	SUBSCALE NAME					
	Race	Religion	Socioeconomic Status	Intelligence	Handicap	Total Scale
Number of Items	7	6	7	7	6	33
Mean	11.83	9.66	12.41	12.06	11.03	56.99
Standard Deviation	3.08	3.15	2.60	2.53	2.90	10.24
Skewness	-.02	-.03	-.14	.12	.01	.33
Kurtosis	.29	.31	.40	.55	.12	.76
Guttman's LAMBDA-3 Reliability	.61	.76	.50	.35	.69	.84
Coefficient Alpha Reliability	.52	.69	.38	.25	.60	.80
Standard Error of Measurement	2.14	1.75	2.04	2.19	1.83	4.55
Average Inter-Item Correlation	.13	.27	.08	.05	.20	.11
Average Item Mean	1.69	1.61	1.77	1.72	1.84	1.73

NOTE: Based on subsample of 2,886 7th grade students.

TABLE 7

SELECTED TECHNICAL CHARACTERISTICS OF GOAL II:
TOLERANCE TOWARD OTHERS SCALE (GRADE 9)

TECHNICAL CHARACTERISTIC	SUBSCALE NAME					
	Race	Religion	Socioeconomic Status	Intelligence	Handicap	Total Scale
Number of Items	7	6	7	7	6	33
Mean	12.22	10.44	12.53	12.26	11.22	58.68
Standard Deviation	3.24	3.03	2.59	2.57	2.81	10.55
Skewness	-.10	-.06	-.10	.06	.02	.30
Kurtosis	.53	.54	.90	.68	.23	.99
Guttman's LAMBDA-3 Reliability	.71	.80	.60	.49	.74	.88
Coefficient Alpha Reliability	.63	.72	.48	.37	.65	.84
Standard Error of Measurement	1.98	1.60	1.86	2.03	1.67	4.21
Average Inter-Item Correlation	.19	.30	.12	.08	.23	.14
Average Item Mean	1.75	1.74	1.79	1.75	1.87	1.78

NOTE: Based on subsample of 3,014 9th grade students.

TABLE 8

CORRELATION MATRIX BETWEEN SUBSCALES FOR TOLERANCE TOWARD OTHERS SCALE: GRADE 7

	SUBSCALE NAME			
SUBSCALE NAME	Race	Religion	Socioeconomic Status	Intelligence
Religion	.40			
Socioeconomic Status	.41	.38		
Intelligence	.36	.29	.41	
Handicap	.43	.31	.49	.49

TABLE 9

CORRELATION MATRIX BETWEEN SUBSCALES FOR TOLERANCE TOWARD OTHERS SCALE: GRADE 9

	SUBSCALE NAME			
SUBSCALE NAME	Race	Religion	Socioeconomic Status	Intelligence
Religion	.45			
Socioeconomic Status	.49	.41		
Intelligence	.40	.30	.49	
Handicap	.46	.35	.49	.53

TABLE 10

CRITERION-REFERENCED RELIABILITY AND PROPORTION OF STUDENTS EXCEEDING EACH OF THREE CRITERION LEVELS: TOLERANCE TOWARD OTHERS (GRADES 7 AND 9)

		CRITERION LEVELS					
		Level One		Level Two		Level Three	
GRADE	SUBSCALE NAME	Prop. Passing	Reliability	Prop. Passing	Reliability	Prop. Passing	Reliability
7	Race	.85	.76	.68	.52	.47	.60
7	Religion	.71	.71	.54	.69	.35	.88
7	Socioeconomic Status	.92	.83	.80	.52	.60	.39
7	Intelligence	.93	.71	.75	.30	.43	.43
7	Handicap	.85	.79	.67	.54	.45	.69
7	Total Scale	.97	.97	.80	.87	.53	.78
9	Race	.87	.86	.74	.64	.56	.60
9	Religion	.81	.81	.65	.65	.46	.79
9	Socioeconomic Status	.93	.89	.82	.62	.65	.42
9	Intelligence	.94	.80	.79	.43	.50	.43
9	Handicap	.86	.85	.72	.60	.52	.67
9	Total Scale	.98	.98	.85	.92	.64	.81

Goal Statement

Quality education should help every child acquire to the fullest extent possible for him mastery of the basic skills in the use of words and numbers.

Goal Rationale

Mastery of the basic skills in the use of words and numbers is fundamental to achievement in all academic areas. Basic skills include the ability to acquire ideas through reading and listening, the ability to handle mathematical operations and the ability to reason logically and to respect evidence. The level of performance that can be reasonably expected in each of these areas will vary from school to school. However, it is of profound importance that the level of expectation in basic skills for any group of pupils shall not be underestimated or regarded as fixed.

Measurement Rationale

In 1969 when Pennsylvania's Educational Quality Assessment program centered on 5th and 11th grade students, schools had the option of selecting either of two standardized achievement batteries for measurement in this goal area. It quickly became apparent that the use of these tests increased the length of the testing time to such an extent as to cause great difficulty in scheduling and completing the entire battery.

Therefore, the use of achievement batteries was discontinued and shorter verbal and math scales developed by Educational Testing Service which were group reliable were substituted.

In the verbal area assessment was directed at the ability to abstract or generalize and to think constructively, rather than at simple fluency or vocabulary recognition. The item type thought most appropriate was one using verbal analogies.

The test in the math area is directed at those mathematics skills and concepts all students should be familiar with and not skills and concepts attainable only by gifted children. Separate math and verbal scales were utilized for each grade level (grades 7 and 9).

General Scale Description (Verbal)

The grade 7 and 9 verbal scales[1] each contain 30 verbal analogies presented in a multiple-choice format. Each scale is timed (15 minutes). The scales are scored by giving one point for each correct answer. No adjustment is made for guessing.

Sample Grade 7 item:

SHOE: FOOT::

A muffler : scarf
B sleeve : coat
C cuff : leg
*D glove : hand

Sample grade 9 item:

TERMITE: BUILDING::

A ant : hive
B spider : fly
C weed : garden
*D worm : apple

General Scale Description (Math)

Both the grade 7 and 9 math scales[2] are 30-item timed tests (15 minutes). Their ability to discern specific strengths and weaknesses in math-related areas is limited. However, they are considered to be a good measure for the general level of math achievement on a group basis. Modern math concepts (set notion, modular arithmetic, etc.) and advanced concepts such as trigonometry, logic and geometric proofs are not included. Areas tapped are arithmetic computation, algebraic and geometric concepts and measurement. A multiple-choice format is used for these scales. Each item requires students to make a size comparison between two quantities. The scales are scored by assigning one point to each correct answer. No adjustment is made for guessing.

Sample grade 7 item:

Column A	Column B
5 feet, 8 inches	58 inches

*A The part in Column A is greater.
B The part in Column B is greater.
C The two parts are equal.
D Not enough information is given to decide.

[1]Copyright (c) 1971, Educational Testing Service
[2]Copyright (c) 1972, Educational Testing Service

Sample grade 9 item:

Column A	Column B
(6 x 8) + (4 x 8)	10 x 8

A The part in Column A is greater.
B The part in Column B is greater.
*C The two parts are equal.
D Not enough information is given to decide.

*Indicates correct answer

TABLE 11

SELECTED TECHNICAL CHARACTERISTICS OF GOAL III:
VERBAL AND MATH SCALES (GRADE 7)

TECHNICAL CHARACTERISTICS	SCALE NAME	
	Verbal	Math
Number of Items	30	30
Mean	16.78	17.93
Standard Deviation	5.22	5.71
KR-20 Reliability	.79	.83
Standard Error of Measurement	2.39	2.35
Average Inter-Item Correlation	.11	.14
Average Item Difficulty Level	.56	.60

NOTE: Based on subsample of 2,888 7th grade students.

TABLE 12

SELECTED TECHNICAL CHARACTERISTICS OF GOAL III:
VERBAL AND MATH SCALES (GRADE 9)

TECHNICAL CHARACTERISTICS	SCALE NAME	
	Verbal	Math
Number of Items	30	30
Mean	17.45	17.20
Standard Deviation	5.46	5.08
KR-20 Reliability	.82	.78
Standard Error of Measurement	2.35	2.39
Average Inter-Item Correlation	.13	.11
Average Item Difficulty Level	.58	.57

NOTE: Based on subsample of 3,003 9th grade students.

GOAL IV: INTEREST IN SCHOOL AND LEARNING

Goal Statement

Quality education should help every child acquire a positive attitude toward school and toward the learning process.

Goal Rationale

The school represents perhaps the most powerful single force in determining a person's overall attitude toward learning. In this regard, the climate and learning atmosphere present in the school, the nature of the educational experiences the school provides and the quality of the personal interactions it fosters between student and educator, all significantly shape the students' life-long attitudes toward learning.

The school experience should be such that students find the learning activities associated with it enjoyable and rewarding to the point that they are motivated to do well and to continue learning on their own initiative beyond the requirements of formal education. Everything possible should be done to ensure that the attitude of the teacher, the atmosphere of the school, and the school's physical condition contribute toward this end so that the individual, both as a child and later as an adult, will hold education high among his or her values.

Measurement Rationale

In assessing student feelings about education, it is necessary not only to examine those feelings within the context of the students' present school experience but also to make some determination regarding the ways this experience is influencing the students' general future attitude toward learning beyond the formal educational setting. The measurement, device developed in support of this goal attempts to sample student attitudes in two areas: The first, relates specifically to the present school experience and the second focuses on learning in its broader context as a long-range, life-time process.

General Scale Description*

In this scale there are 30 statements about the school, teachers, course content and the learning experience. Fifteen items cast these areas in a favorable light, e.g., *"Most of my subjects this year are worthwhile."* The remaining items are negatively stated, e.g., *"Teachers don't know what they are talking about."* Response options available to the student are (1) strongly agree, (2) agree, (3) uncertain, (4) disagree, (5) strongly disagree.

The items within the scale are grouped into two subscales each having 15 items.

Subscale 1:

Attitude toward learning measures the student's willingness to expand effort to learn and the value of continued learning throughout life. Sample item: *"It is very important to me to learn as much as I possibly can."*

Subscale 2:

Attitude toward school investigates the degree to which the student believes school attendance is important and the student's attitude toward the school setting, teachers and course work. Sample item: *"Most of my classes this year are boring."*

Norm-Referenced Scoring

For norm-referenced scoring, the following weighing scheme is used:

	Response Options				
Item Dir.	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
Plus	4	3	2	1	0
Minus	0	1	2	3	4

Criterion-Referenced Scoring

Responses are considered favorable if they reflect student agreement with positive statements about school and learning or disagreement with negative statements concerning school and learning. A student's score on a given scale (total or subscale) is the percentage of items to which a favorable response was given. For this scale the scoring scheme applied to the items is:

*The interest in school and learning scale is a result of extensive revisions of the Goal IV instrument which was used for grades 5 and 11. George E. Brehman from the Division of Research and Nolan F. Russell from the Division of Educational Quality Assessment were responsible for the revisions.

Response Choices

Item Dir.	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
Plus	1	1	0	0	0
Minus	0	0	0	1	1

Each student's score is then compared to a standard having three levels. To meet level one the student must respond favorably to more than 35 per cent of the items. To meet level two the student must respond favorably to more than 51 per cent of the items. Level three requires students to choose favorable response choices to more than 70 per cent of the items.

Technical Properties

The interest in school and learning scale has a reading difficulty level of 4.6. Reliability estimates were obtained separately for low, average and high achiever groups at both grades. Coefficient alphas were found to be .91, .90 and .88 at grade 7 and .89, .88 and .84 at grade 9.

Tables 13 and 14 list selected scale characteristics derived from the total grade 7 and 9 subsamples. The intercorrelation between the two subscales is .70 at grade 7 and .67 at grade 9. Table 15 gives the reliability estimates obtained through criterion-referenced scoring and shows the proportion of students meeting each criterion level.

Validity

A 36-item version of this scale was administered to 130 high school students in a suburban Pittsburgh school. Teachers identified high-middle-low interest groups based upon their observations of student behavior patterns in school. The scale discriminated between the high and low groups and the middle and low groups but failed to discriminate significantly between the middle and high groups.

TABLE 13

SELECTED TECHNICAL CHARACTERISTICS OF GOAL IV:
INTEREST IN SCHOOL AND LEARNING SCALE (GRADE 7)

TECHNICAL CHARACTERISTICS	SUBSCALE NAME		
	Interest Toward Learning	Interest Toward School	Total Scale
Number of Items	15	15	30
Mean	40.93	37.29	78.22
Standard Deviation	8.20	10.58	17.34
Skewness	-.72	-.56	-.62
Kurtosis	1.82	.19	.91
Guttman's LAMBDA-3 Reliability	.84	.89	.92
Coefficient Alpha Reliability	.82	.89	.92
Standard Error of Measurement	3.97	3.52	5.06
Average Inter-Item Correlation	.23	.35	.26
Average Mean Mean	2.73	2.49	2.61

NOTE: Based on subsample of 2,886 7th grade students.

TABLE 14

SELECTED TECHNICAL CHARACTERISTICS OF GOAL IV: INTEREST IN SCHOOL AND LEARNING SCALE (GRADE 9)

TECHNICAL CHARACTERISTICS	SUBSCALE NAME		
	Interest Toward Learning	Interest Toward School	Total Scale
Number of Items	15	15	30
Mean	39.88	36.21	76.09
Standard Deviation	7.84	10.16	16.49
Skewness	-.60	-.61	-.60
Kurtosis	1.09	.30	.71
Guttman's LAMBDA-3 Reliability	.85	.90	.92
Coefficient Alpha Reliability	.82	.89	.91
Standard Error of Measurement	3.31	3.36	4.84
Average Inter-Item Correlation	.24	.35	.26
Average Item Mean	2.66	2.41	2.54

NOTE: Based on subsample of 3,006 9th grade students.

TABLE 15

CRITERION–REFERENCED RELIABILITY AND PROPORTION OF STUDENTS EXCEEDING EACH OF THREE CRITERION LEVELS: INTEREST IN SCHOOL AND LEARNING (GRADES 7 AND 9)

		CRITERION LEVELS					
		Level One		Level Two		Level Three	
GRADE	SUBSCALE NAME	Prop. Passing	Relia-bility	Prop. Passing	Relia-bility	Prop. Passing	Relia-bility
7	Attitude toward Learning	.90	.95	.80	.85	.51	.77
7	Attitude toward School	.75	.91	.62	.85	.38	.90
7	Total Scale	.87	.97	.70	.90	.44	.89
9	Attitude toward Learning	.89	.95	.78	.84	.49	.49
9	Attitude toward School	.75	.90	.60	.84	.34	.91
9	Total Scale	.87	.97	.69	.89	.41	.90

GOAL V: CITIZENSHIP

Goal Statement

Quality education should help every child acquire the habits and attitudes associated with responsible citizenship.

Goal Rationale

Responsible citizenship embodies a much more complex concept than commonly expressed in love of country and participation in the democratic processes. Viewed in its broadest sense responsible citizenship implies a respect for law and proper authority, a willingness to assume responsibility for our own actions and for those of the groups to which we belong, respect for the rights of others and overall personal integrity.

Schools should encourage pupils to be willing to assume responsibility for their actions as well as the actions of the group. Opportunities should be provided for pupils to cooperate and work toward group goals and to demonstrate integrity in dealing with others. Pupils should be given the chance to take the initiative and assume leadership for group action as well as lend support to group efforts as followers.

Measurement Rationale

The mores, codes, laws and social expectations of society provide the reference points for judging which behaviors reflect *"responsible"* citizenship and which behaviors indicate *"poor"* citizenship. A review of literature revealed that the National Assessment of Educational Progress developed nine general citizenship objectives. The criterion for inclusion of any one objective was its relative importance to society as agreed upon by a committee of scholars and lay people.

These national objectives were used to provide the frame of reference for what was to be measured. Objectives in the cognitive domain such as (a) knowing structure of government and (b) understanding problems of international relations were excluded from consideration in developing the scale.

Arriving at a satisfactory definition of citizenship was much less complicated than applying the definition to the assessment of students' attitudes and behaviors. The display of responsible citizenship behaviors like *"honesty"* or *"integrity"* are most often situational.

A student's display of good citizenship behavior under one set of motivating conditions tells us little about the way he or she can be expected to behave if those conditions are altered. The context in which the behavior is elicited therefore becomes at least as important in determining the outcome as the predisposition of the individual involved.

One way of overcoming this problem is to utilize a behavior-referenced model which incorporates elements related to the psychological notion of *"threshold."* Used in reference to citizenship, threshold refers to that set of conditions necessary to bring about the desirable responses. Thus by varying the situation and introducing conditions of reward and punishment we are able to determine the cutoff levels at which the student will display positive behavior. In this way it is possible to assess not only the students' predisposition to behave in a manner consistent with responsible citizenship but also to provide some measure of the intensity of that predisposition across a spectrum of situations.

General Scale Description*

Fifty-four items measure willingness to exhibit good citizenship in many social situations under a variety of motivating conditions. Social contexts are given by 18 stories, each posing a problem and suggesting an action predefined as good or poor citizenship. Each story has three items which list positive or negative consequences resulting from the action. Students are asked to decide whether to take the action for each consequence.

Sample Story:

> Morton has broken a school window but did not mean to. If I were Morton, I would TELL THE PRINCIPAL or teacher about my breaking the window when I knew...

*Nolan F. Russell from the Division of Educational Quality Assessment is the author of the citizenship scale.

Sample item set:

		Yes	Maybe	No
1.	The principal would make me stay after school.	Y	M	N
2.	My parents would have to pay for the window.	Y	M	N
3.	I would have to pay for the window.	Y	M	N

The items within the scale are grouped in such a way as to yield three subscale scores in addition to a total score.

Subscale 1:

Concern for the welfare and dignity of others contains 15 items (item sets from five stories) designed to measure concern for the feelings of others, willingness to protest unjust treatment of others, and the tendency to accept new people into a group. Also measured is the degree of restraint from teasing or degrading others.

Subscale 2:

Respect for law and authority has 21 items measuring the willingness to report law-breaking of others, obey authorities during emergencies, and prevent classroom disruptions. Also assessed is the degree of restraint from violent actions that could harm others or damage property.

Subscale 3:

Personal responsibility and integrity has 18 items which tap the willingness to honor self-made commitments to individuals or groups and the willingness to take responsibility for one's own mistakes and to report mistakes made in one's favor.

Norm-Referenced Scoring

The following item weighting scheme is used for norm-referenced scoring:

	Response Options		
Behavior Direction	Yes	Maybe	No
Plus Citizenship	2	1	0
Minus Citizenship	0	1	2

Criterion-Referenced Scoring

Responses are considered *"favorable"* when they reflect a willingness to display proper citizenship behaviors or an unwillingness to use poor citizenship behaviors. A student's score on a given scale (total or subscale) is the percentage of items to which a favorable response was given. For the citizenship scale the scoring scheme applied to the items is:

	Response Choices		
Behavior Direction	Yes	Maybe	No
Positive Citizenship	1	0	0
Negative Citizenship	0	0	1

Each student's score is then compare to a standard having three levels. To meet level one the student must respond favorably to more than 35 per cent of the items. To meet level two the student must respond favorably to more than 51 per cent of the items. Level three requires students to choose favorable response choices to more than 70 per cent of the items.

Technical Properties

The stories used in this scale have a reading difficulty level of 4.9 while the items have a reading level of 4.0. Reliabilities computed across low, average and high achiever groups (as defined by scores on the composite math-verbal scales) were .86, .94 and .95 at grade 7 and .89, .94 and .95 at grade 9.

Tables 16 and 17 present selected technical characteristics based on norm-referenced scoring for grades 7 and 9 respectively. Table 20 displays the reliabilities found for the total scale and subscales at three criterion levels and gives the proportion of students meeting each criterion.

Validity

The degree of correspondence between what one *"says"* on a paper and pencil test and what one actually *"does"* in real situations is an important consideration when evaluating a test. In January, 1972 a study was conducted to determine the efficacy of an 88-item version of the citizenship scale to discriminate between persons independently identified as displaying poor interpersonal and social adjustment to those not so identified.

The study was conducted in a home for wayward girls located in western Pennsylvania. The institution has a *"stated"* policy of periodic appraisal (every three months) of each resident's social and emotional adjustment. Evaluations are made by a three member team including a psychologist, a case worker and a cottage attendant. Characteristics which are evaluated include personal responsibility, honesty, fighting behaviors and ability to get along with others. Assignments to living quarters are made contingent upon the above evaluations. As a girl's adjustment improves, she is moved to another cottage with girls of similar adjustment and with more privileges. There are five cottage units in the institution with cottage number five housing the *"most adjusted"* of the residents.

The scale was administred to the entire population of girls (N = 46) living in the institution. For purposes of analysis the girls were separated into two groups. Those living in the first three cottages formed group one (*"most maladjusted"* N = 25). Group two (*"most adjusted"* N = 21) was composed of girls housed in cottages four and five.

Analyses revealed that the citizenship scale could (1) discriminate between these two groups (the adjusted group scoring higher) and (2) discriminate between the total institutional group and a group of public school children having similar home background (the public school group scoring higher).

It is of some interest to note that upon interrogating the data received from the institution two cases were discovered within the *"adjusted"* group which displayed extremely low scores in relation to others in that group. Further checking with the institution personnel revealed that these two individuals were new admissions who had been placed in the upper cottages until they could be evaluated and had not earned admission to these cottages via the usual evaluative procedure. These were the only two girls in the institution who were placed in cottages without prior evaluation.

A similar study conducted in April 1973 used boys residing in a Youth Development Center in western Pennsylvania. A 51-item version of the citizenship scale discriminated between a group of new arrivals and a group of residents ready to be released (the latter group scoring higher).

TABLE 16

SELECTED TECHNICAL CHARACTERISTICS OF GOAL V:
CITIZENSHIP SCALE (GRADE 7)

TECHNICAL CHARACTERISTIC	SUBSCALE NAME: Concern for Welfare of Others	Respect for Law and Authority	Responsibility and Integrity	Total Scale
Number of Items	15	21	18	54
Mean	18.24	24.99	20.78	64.01
Standard Deviation	5.99	8.67	7.51	19.56
Skewness	-.01	-.03	-.08	.06
Kurtosis	-.54	-.38	-.40	-.34
Guttman's LAMBDA-3 Reliability	.85	.89	.88	.95
Coefficient Alpha Reliability	.80	.86	.84	.93
Standard Error of Measurement	2.69	3.28	2.97	5.28
Average Inter-Item Correlation	.21	.22	.23	.19
Average Item Mean	1.22	1.19	1.15	1.19

NOTE: Based on subsample of 2,882 7th grade students.

TABLE 17

SELECTED TECHNICAL CHARACTERISTICS OF GOAL V:
CITIZENSHIP SCALE (GRADE 9)

TECHNICAL CHARACTERISTIC	SUBSCALE NAME			
	Concern for Welfare of Others	Respect for Law and Authority	Responsibility and Integrity	Total Scale
Number of Items	15	21	18	54
Mean	18.17	22.57	19.66	60.41
Standard Deviation	5.98	9.13	7.85	20.18
Skewness	-.08	.08	-.02	.11
Kurtosis	-.47	-.51	-.58	-.46
Guttman's LAMBDA-3 Reliability	.85	.90	.89	.95
Coefficient Alpha Reliability	.80	.87	.86	.93
Standard Error of Measurement	2.67	3 29	2.99	5.31
Average Inter-Item Correlation	.21	.24	.25	.20
Average Item Mean	1.21	1.08	1.09	1.12

NOTE: Based on subsample of 3,005 9th grade students.

TABLE 18

CORRELATION MATRIX BETWEEN SUBSCALES
FOR CITIZENSHIP SCALE: GRADE 7

	SUBSCALE NAME	
SUBSCALE NAME	Concern for Welfare of Others	Respect for Law and Authority
Respect for Law and Authority	.65	
Responsibility and Integrity	.66	.68

TABLE 19

CORRELATION MATRIX BETWEEN SUBSCALES
FOR CITIZENSHIP SCALE: GRADE 9

	SUBSCALE NAME	
SUBSCALE NAME	Concern for Welfare of Others	Respect for Law and Authority
Respect for Law and Authority	.62	
Responsibility and Integrity	.65	.69

TABLE 20

CRITERION-REFERENCED RELIABILITY AND PROPORTION OF STUDENTS EXCEEDING EACH OF THREE CRITERION LEVELS: CITIZENSHIP (GRADE 7 AND 9)

		CRITERION LEVELS					
		Level One		Level Two		Level Three	
GRADE	SUBSCALE NAME	Prop. Passing	Relia-bility	Prop. Passing	Relia-bility	Prop. Passing	Relia-bility
7	Welfare & Dignity of Others	.60	.80	.40	.81	.18	.95
7	Respect for Law & Authority	.60	.86	.37	.86	.18	.96
7	Responsibility & Integrity	.56	.83	.31	.87	.15	.96
7	Total Scale	.64	.94	.34	.93	.14	.98
9	Welfare & Dignity of Others	.61	.80	.40	.81	.18	.95
9	Respect for Law & Authority	.51	.85	.32	.89	.14	.98
9	Responsibility & Integrity	.52	.83	.28	.89	.14	.98
9	Total Scale	.59	.83	.30	.94	.12	.98

GOAL VI: HEALTH HABITS

Goal Statement

Quality education should help every child acquire good health habits and an understanding of the conditions necessary for the maintenance of physical and emotional well-being.

Goal Rationale

In their own interest, as well as in the interest of society at large, children should know how to take care of themselves and how to keep physically fit. They should know what the requirements are for physical and mental health and what practices, harmful to health, should be avoided. After gaining this knowledge they should acquire habits of actions which increase the probability to remain healthy and fit throughout life.

In cases where the home has been deficient in encouraging the child to practice sound health habits, the school has an obligation to be aware of the situation and to see that opportunities to remedy the deficiency are provided.

Measurement Rationale

Understanding how principles such as disease and their prevention, dental care, nutrition, personal hygiene, safety and drug use relate to the structure and function of the human body is an important first step in each individual's health related development. More important, however, is the individual's willingness to consistently exhibit habits which are conducive to the maintenance of personal health and well-being. One does not need to be a doctor to display good health practices or a lawyer to display good citizen behaviors.

Therefore, assessment in this goal area attempts to get at students' willingness to display proper health behaviors in a variety of situational contexts.

General Scale Description*

The scaling technique developed for use in this inventory is similar to the psychophysical method of limits. This method holds the behavior constant while systematically allowing the stimuli to vary. The strength of the stimulus (in physical units) which is required to cause a change in the behavior is used to define the threshold of that behavior.

In the case of this health behavior inventory, the student is asked to decide whether he or she would take a given health-related action. Each action is predefined as indicating either good or poor health practice. Stimulus contexts surrounding the choices are systematically varied. The health-behavior threshold is defined in terms of the severity of the stimulus contexts tolerated before changing from good to poor health behavior. More specifically performance is used to infer health-behavior threshold by identifying the supportive contingencies in the environment necessary to maintain good health practices.

The format of each question takes the form of a situational story about a make-believe junior high student. The respondent is first asked to consider taking a specific action. In each question three motivation-inducing conditions, i.e., rewards and punishments, are made contingent upon the taking of the action.

Sample story:

> When Norma had the flu the doctor gave her some medicine. The medicine also took away the stomach ache Norma had. After she got over the flu, Norma had another stomach ache. If I were Norma, I would TAKE THE MEDICINE AGAIN when I thought...

Sample item set:

		Yes	Maybe	No
1.	The medicine tasted good.	Y	M	N
2.	It might cure my stomach ache quickly.	Y	M	N
3.	My parents might not want me to take it.	Y	M	N

The items within the scale were grouped in such a way as to yield three subscale scores in addition to a total scale score.

Subscale 1:

> *Personal and community health* contains 21 items (seven health situations). Content includes willingness to follow proper diet, to take proper medical precautions, to use good personal hygiene practices and to refrain from interpersonal contacts when ill.

*The health habits scale was developed jointly by Nolan F. Russell and Eugene W. Skiffington from the Division of Educational Quality Assessment and Mary L. Lydon from the Division of Research.

Subscale 2:

Personal and community safety contains 18 items from six health situations. Measured is the degree of restraint from unnecessary risk-taking at home, at school and at play and restraint from submitting others to undue risks.

Subscale 3:

Drugs contain five situations with 15 questions to measure restraint from (1) improper use of prescription drugs, (2) experimentation with drugs and (3) maintaining close contact with others who are using drugs. Improper use of prescription drugs includes restraint from using old medicine, medication prescribed for others, or more medicine than has been prescribed by the doctor.

Norm-Referenced Scoring

For norm-reference scores, the following item weighting scheme is used:

	Response Options		
Behavior Direction	Yes	Maybe	No
Plus Health Behavior	2	1	0
Minus Health Behavior	0	1	2

Criterion-Referenced Scoring

Responses are considered favorable when they reflect a willingness to take good health-related actions or an unwillingness to display behaviors that might be harmful to health. A student's score on a given scale (total or subscale) is the percentage of items to which a favorable response was given. For the health scale the scoring scheme applied to the items is:

	Response Choices		
Behavior Direction	Yes	Maybe	No
Good Health Practice	1	0	0
Poor Health Practice	0	0	1

Each student's score is then compared to a standard having three levels. To meet level one the student must respond favorably to more than 35 per cent of the items. To meet level two the student must respond favorably to more than 51 per cent of the items. Level three requires students to choose favorable response choices to more than 70 per cent of the items.

Technical Properties

The grade level readability for the stories used in the health habits scale is 4.8. The items associated with the stories have a readability level of 3.9. Reliabilities computed across low, average and high achievement groups as defined by composite math-verbal scores were .83, .91 and .92 for grade 7 and .86, .92 and .93 for grade 9.

Tables 21 and 22 present selected technical characteristics derived from analyses using norm-referenced data from grades 7 and 9 respectively. Tables 23 and 24 show the intercorrelations between subscales. Table 25 gives the reliabilities associated with each of the three criterion levels and shows the proportion of students meeting each criterion.

TABLE 21

SELECTED TECHNICAL CHARACTERISTICS OF GOAL VI:
HEALTH HABITS SCALE (GRADE 7)

TECHNICAL CHARACTERISTICS	SUBSCALE NAME			
	Personal Health	Safety	Drugs	Total Scale
Number of Items	24	15	15	54
Mean	28.71	17.52	21.56	67.79
Standard Deviation	7.83	6.92	6.11	17.26
Skewness	.21	-.03	-.60	.13
Kurtosis	-.27	-.77	-.25	-.53
Guttman's LAMBDA-3 Reliability	.83	.88	.88	.93
Coefficient Alpha Reliability	.79	.85	.83	.90
Standard Error of Measurement	3.63	2.71	2.48	5.34
Average Inter-Item Correlation	.13	.27	.25	.15
Average Item Mean	1.20	1.17	1.44	1.26

NOTE: Based on subsample of 2,838 7th grade students.

TABLE 22

SELECTED TECHNICAL CHARACTERISTICS OF GOAL VI:
HEALTH HABITS SCALE (GRADE 9)

TECHNICAL CHARACTERISTICS	SUBSCALE NAME			
	Personal Health	Safety	Drugs	Total Scale
Number of Items	24	15	15	54
Mean	28.05	17.22	21.00	66.28
Standard Deviation	8.10	7.21	6.61	18.11
Skewness	.08	-.12	-.68	-.03
Kurtosis	-.11	-.71	-.19	-.35
Guttman's LAMBDA-3 Reliability	.84	.89	.90	.93
Coefficient Alpha Reliability	.80	.86	.86	.91
Standard Error of Measurement	3.66	2.69	2.52	5.39
Average Inter-Item Correlation	.14	.29	.28	.16
Average Item Mean	1.17	1.15	1.40	1.23

NOTE: Based on subsample of 2,991 9th grade students.

TABLE 23

CORRELATION MATRIX BETWEEN SUBSCALES FOR HEALTH HABITS SCALE: GRADE 7

	SUBSCALE NAME	
SUBSCALE NAME	Personal Health	Safety
Safety	.52	
Drugs	.46	.61

TABLE 24

CORRELATION MATRIX BETWEEN SUBSCALES FOR HEALTH HABITS SCALE: GRADE 9

	SUBSCALE NAME	
SUBSCALE NAME	Personal Health	Safety
Safety	.53	
Drugs	.46	.59

TABLE 25

CRITERION-REFERENCED RELIABILITY AND PROPORTION OF STUDENTS EXCEEDING EACH OF THREE CRITERION LEVELS: HEALTH HABITS (GRADES 7 AND 9)

		CRITERION LEVELS					
		Level One		Level Two		Level Three	
GRADE	SUBSCALE NAME	Prop. Passing	Relia-bility	Prop. Passing	Relia-bility	Prop. Passing	Relia-bility
7	Personal Health	.67	.83	.35	.82	.14	.94
7	Safety	.55	.85	.39	.87	.21	.97
7	Drugs	.79	.94	.68	.87	.45	.89
7	Total Scale	.75	.95	.45	.91	.18	.97
9	Personal Health	.68	.83	.34	.83	.13	.95
9	Safety	.57	.85	.39	.87	.20	.97
9	Drugs	.79	.94	.66	.87	.43	.89
9	Total Scale	.76	.95	.45	.91	.17	.97

GOAL VII: CREATIVITY

Goal Statement

Quality education should give every child opportunity and encouragement to be creative in one or more fields of endeavor.

Goal Rationale

The notion of creativity has been variously defined. It is being used here to encompass worthwhile activities that children initiate and pursue on their own – activities having an outcome that is perceived by the children themselves or by others as a contribution to some part of their world. Such activities can be found in a wide variety of fields, not only the sciences and the arts, but also the organization of human affairs and the development and exercise of salable skills in the production of any of a host of practical things that enrich our way of living.

The school should offer an environment which will encourage and reinforce those activities that can enable children to express themselves creatively and productively.

Measurement Rationale

Attempts to assess creativity have traditionally utilized methods which analyze the various components of the creative process or subjective judgments about the quality of the product of the creative act. Neither of these procedures is particularly well adapted to a large scale assessment effort which covers the broad spectrum of creative talent represented in the school. In order to overcome this problem a two-dimensional model of creativity was proposed which provided a theoretical basis for the assessment of Goal VII. The first dimension is based on the student-expressed interest in becoming engaged in creative activities, while the second attempts to determine the extent of recognition gained through active involvement. This approach seems sound since the Goal VII statement stresses opportunities and encouragement for all students relative to creativity rather than emphasizing selective creative output.

General Scale Description*

The creative activities checklist contains 36 activities which require originality in the areas of visual arts, performing arts, science and writing. Sample activities include: performed an original scientific experiment using living things; written an original poem; modeled an outfit using own style; performed using an original magic or novelty act.

Response options give six ways to show degree of involvement in each activity. Options are (1) No, and have not wanted to; (2) No, but have wanted to; (3) Yes, but with no recognition; (4) Yes, with teacher or adult leader recognition; (5) Yes, with school-wide recognition; and (6) Yes, with area-wide recognition. The scale contains four subscales each having nine items.

Subscale 1:

Visual arts contains nine items, some dealing with more than one activity, are included in this subscale. Activities include sculpturing, cartooning, printmaking, graphic design, painting, photography, flower arrangement, design of window displays, stage sets, decorative items and clothing.

Subscale 2:

Performing arts contain nine items which include activities dealing with singing, speech, music, magic, modeling, directing, acting and sports.

Subscale 3:

Writing arts contain nine items related to writing such as poetry, news, essays, stories, scripts, letters, jokes and recipes.

Subscale 4:

Science activities contain nine items such as performing experiments using physical objects or living things, constructing models to show a scientific principle, exploring, training animals, directing recreational activities, developing campaign strategies for (school) elections, working with radios or other electronic equipment, and designing gadgets.

*The creativity scale was developed by James F. Hertzog and Nolan F. Russell both from the Division of Educational Quality Assessment.

Norm-Referenced Scoring

All items in this scale are positively worded. Each item describes an activity and asks the students to describe the level of their involvement in that activity.

Response Options	Score Obtained
(1) No, and have not wanted to.	0
(2) No, but have wanted to.	1
(3) Yes, but no recognition.	2
(4) Yes, with teacher or adult leader recognition.	3
(5) Yes, with school-wide recognition.	4
(6) Yes, with area-wide recognition.	5

Criterion-Referenced Scoring

Two criterion-referenced scoring methods are used for this scale. The first defines as *"favorable"* those choices which reflect a willingness to try the activities presented in the scale. Thus only the option *"No, and have not wanted to"* is considered unfavorable. Scores generated from this method are called Attitude Toward Creative Activities.

The second scheme defines as *"favorable"* those choices indicating that the student has actually participated in the activity. Thus two choices are considered unfavorable: *"No, and have not wanted to"* and *"No, but have wanted to."*

The two scores obtained by each student are then compared to a standard having three levels. To meet level one the student must respond favorably to more than 35 per cent of the items. To meet level two the student must respond favorably to more than 51 per cent of the items. Level three requires the student to choose favorable response choices to more than 70 per cent of the items.

Technical Properties

The grade level readability for the creativity scale is 6.7. Reliability coefficients based on low, average and high achievement groups as defined by composite scores on the math-verbal scales were found to be .92, .90 and .89 at grade 7 and .91, .91 and .90 at grade 9. This scale is the only EQAI instrument which does not contain reflected items. Therefore, it is important to estimate the amount of influence response bias has on total scale scores. This was done by finding the number of students in the grade 7 and 9 subsamples who obtained perfect scores on the scale. To get a perfect score the student must choose response choice six which reads *"Yes, I have done this activity and have received area-wide recognition for its quality."* Of course, no youngster could have realistically received area-wide recognition for all 36 activities. Only one student out of the 5,894 students in these two samples obtained a perfect score.

Tables 26 and 27 present selected norm-referenced properties of the creativity scale for grade 7 and 9 respectively. Tables 28 and 29 display the intercorrelations between the subscales. Tables 30 and 31 give the internal consistency reliabilities associated with each of the three criterion levels and shows the proportion of students meeting each criterion for each of the two criterion-referenced scoring methods.

TABLE 26

SELECTED TECHNICAL CHARACTERISTICS OF GOAL VII:
CREATIVE ACTIVITIES SCALE (GRADE 7)

TECHNICAL CHARACTERISTICS	SUBSCALE NAME				
	Visual Arts	Performing Arts	Science	Writing	Total Scale
Number of Items	9	9	9	9	36
Mean	12.60	9.91	11.22	12.37	46.10
Standard Deviation	6.61	6.73	6.68	6.64	22.96
Skewness	.75	1.03	.97	.52	.90
Kurtosis	.91	1.09	1.39	.26	1.20
Guttman's LAMBDA - 3 Reliability	.75	.76	.78	.73	.92
Coefficient Alpha Reliability	.74	.75	.77	.71	.91
Standard Error of Measurement	3.34	3.34	3.22	3.55	6.83
Average Inter - Item Correlation	.24	.25	.27	.22	.22
Average Item Mean	1.40	1.10	1.25	1.37	1.28

NOTE: Based on subsample of 2,879 7th grade students.

TABLE 27

SELECTED TECHNICAL CHARACTERISTICS OF GOAL VII:
CREATIVE ACTIVITIES SCALE (GRADE 9)

TECHNICAL CHARACTERISTICS	SUBSCALE NAME				
	Visual Arts	Performing Arts	Science	Writing	Total Scale
Number of Items	9	9	9	9	36
Mean	11.09	8.53	10.04	10.94	40.62
Standard Deviation	6.37	6.49	6.30	6.74	21.95
Skewness	.80	1.35	.97	.75	1.10
Kurtosis	.97	2.50	1.43	.93	2.26
Guttman's LAMBDA - 3 Reliability	.75	.76	.77	.76	.91
Coefficient Alpha Reliability	.74	.75	.76	.75	.91
Standard Error of Measurement	3.24	3.24	3.11	3.36	6.62
Average Inter - Item Correlation	.24	.25	.26	.25	.22
Average Item Mean	1.23	1.95	1.12	1.22	1.13

NOTE: Based on subsample of 3,012 9th grade students.

TABLE 28

CORRELATION MATRIX BETWEEN SUBSCALES FOR CREATIVE ACTIVITIES SCALE: GRADE 7

	SUBSCALE NAME		
SUBSCALE NAME	Visual Arts	Performing Arts	Science
Performing Arts	.66		
Science	.68	.66	
Writing	.64	.68	.61

TABLE 29

CORRELATION MATRIX BETWEEN SUBSCALES FOR CREATIVE ACTIVITIES SCALE: GRADE 9

	SUBSCALE NAME		
SUBSCALE NAME	Visual Arts	Performing Arts	Science
Performing Arts	.64		
Science	.64	.63	
Writing	.62	.66	.56

TABLE 30

CRITERION-REFERENCED RELIABILITY AND PROPORTION OF STUDENTS EXCEEDING EACH OF THREE CRITERION LEVELS: CREATIVE ACTIVITIES ATTITUDE (GRADE 7 AND 9)

		CRITERION LEVEL					
		Level One		Level Two		Level Three	
GRADE	SUBSCALE NAME	Prop. Passing	Reliability	Prop. Passing	Reliability	Prop. Passing	Reliability
7	Visual Arts	.86	.90	.77	.79	.50	.75
7	Performing Arts	.69	.78	.56	.73	.30	.89
7	Science	.80	.87	.70	.76	.43	.82
7	Writing	.81	.83	.69	.72	.40	.81
7	Total Scale	.88	.97	.70	.91	.39	.91
9	Visual Arts	.79	.84	.68	.74	.40	.83
9	Performing Arts	.58	.74	.45	.76	.22	.95
9	Science	.74	.82	.62	.74	.36	.87
9	Writing	.72	.79	.60	.73	.32	.88
9	Total Scale	.82	.95	.58	.90	.28	.94

TABLE 31

CRITERION-REFERENCED RELIABILITY AND PROPORTION OF STUDENTS EXCEEDING EACH OF THREE CRITERION LEVELS: CREATIVE ACTIVITIES (GRADES 7 AND 9)

		CRITERION LEVELS					
		Level One		Level Two		Level Three	
GRADE	SUBSCALE NAME	Prop. Passing	Reliability	Prop. Passing	Reliability	Prop. Passing	Reliability
7	Visual Arts	.55	.64	.39	.74	.12	.97
7	Performing Arts	.33	.78	.21	.91	.06	.99
7	Science	.42	.71	.28	.84	.09	.99
7	Writing	.57	.60	.40	.71	.11	.96
7	Total Scale	.53	.86	.26	.92	.05	.99
9	Visual Arts	.46	.67	.31	.81	.08	.99
9	Performing Arts	.24	.85	.14	.96	.04	.99
9	Science	.37	.74	.23	.88	.07	.99
9	Writing	.48	.68	.32	.81	.09	.99
9	Total Scale	.43	.86	.18	.95	.04	.99

GOAL VIII: VOCATIONAL DEVELOPMENT

Goal Statement

Quality education should help every child understand the opportunities open to him for preparing himself for a productive life and should enable him to take full advantage of these opportunities.

Goal Rationale

Students should be aware of the vast array of possibilities for continuing self-development in the world of work so that they will be motivated to pursue excellence in all forms of human endeavor that are appropriate for them individually.

Most children can profit from some form of education beyond high school, whether it be a four-year college, a school of nursing, a community college, a technical institute or the like. Each student should be aware of these opportunities and seek out the particular kind of education best suited to his or her talents and interests. This goal also implies that the school will provide students with the kind of guidance that will enable them to do so.

Measurement Rationale

Vocational development, for purposes of assessment, is considered to be a series of processes involving both the acquisition of knowledge about different kinds of work and the forming of attitudes which will enhance one's chances of succeeding in the work-a-day world.

In the initial stages of vocational maturity students become aware of different kinds of work and workers. This is followed by a growing understanding of the relatedness of educational and occupational opportunities. The more vocationally mature students will show involvement in the choice process by actively seeking information, accepting personal responsibility for career decisions and finally basing their career choices upon a realistic appraisal of their interests, achievementsand aptitudes.

Two separate scales were developed in this goal area. The first deals with those attitudes which are thought to relate to becoming a productive working member of society. The second explores the knowledge base thought necessary to make appropriate educational-vocational decisions.

General Scale Description* Vocational Attitude

Twenty-six items measure attitude toward work, career choice and efforts at establishing long-range educational plans. Nine items reflect a positive vocational attitude, e.g., *"I am having no difficulty preparing myself for work I want to do."* Seventeen items are worded to reflect vocational immaturity, e.g., *"Why try to decide upon a job when the future is so uncertain?"* Response options are (1) agree, (2) mostly agree, (3) mostly disagree and (4) disagree. This scale has no subscales.

Norm-Referenced Scoring

The following item weighting scheme is used for norm-referenced scoring:

	Response Options			
Item Direction	Agree	Mostly Agree	Mostly Disagree	Disagree
Plus Statements	3	2	1	0
Minus Statements	0	1	2	3

Criterion-Referenced Scoring

Responses are considered *"favorable"* when they reflect vocationally mature attitudes. The scoring scheme used for this scale is as follows:

	Response Choices			
Item Direction	Agree	Mostly Agree	Mostly Disagree	Disagree
Plus Statements	1	1	0	0
Minus Statements	0	0	1	1

*The vocational attitude scale is a result of extensive revisions of the Goal VIII instrument which was used for grades 5 and 11. Richard L. Kohr and J. Robert Coldiron from the Division of Educational Quality Assessment were responsible for the revisions.

Each student's score is then compared to a standard having three levels. To meet level one the student must respond favorably to more than 35 per cent of the items. To meet level two the student must respond favorably to more than 51 per cent of the items. Level three requires the student to choose favorable response choices to more than 70 per cent of the items.

General Scale Description: Vocational Knowledge*

This scale contains 30 items, which focus on the student's knowledge concerning the duties, training and educational requirements of various occupations. The multiple-choice format requires the student to select the best answer from four alternatives.

Sample item (occupational duties):

What kind of work does a surveyor usually do?

A. oversees workers in a factory
*B. determines property boundaries
C. conducts public opinion polls
D. designs roads and highways

Sample item (education):

The lowest level of education you would need to be a lawyer is:

A. high school graduate
B. 1-3 years of school after high school (not college graduate)
C. college graduate
*D. graduate or professional degree

Sample item (training):

Which of these jobs requires a period of apprenticeship?

A. truck driver
B. stockbroker
C. porter
*D. electrician

Norm-Referenced Scoring

One point is given for each correct answer. There is no scoring adjustment for guessing.

Technical Properties

Tables 32 and 33 present selected technical properties of the vocational attitude and vocational knowledge scales for grades 7 and 9 respectively. Note that the internal consistency estimates for the knowledge scale are based on the KR-20 formula while the coefficient alphas are used for the attitude instrument.

The grade level readability for the vocational attitude scale is 7.0. Coefficient alphas for the total scale computed across three ability groups (low, average, high) as defined by scores on the composite math-verbal scales were .60, .63 and .66 for grade 7 and .63, .66 and .71 at grade 9.

Internal consistency reliabilities associated with the three criterion levels were found to be .95, .80 and .71 at grade 7 and .97, .81 and .54 at grade 9. The proportion of students meeting each criterion were .98, .83 and .38 at grade 7 and .99, .89 and .50 at grade 9.

*The authors of the vocational knowledge scale are Francis J. Reardon and James P. Lewis from the Division of Research.

TABLE 32

SELECTED TECHNICAL CHARACTERISTICS OF GOAL VIII: VOCATIONAL ATTITUDE AND KNOWLEDGE SCALES (GRADE 7)

TECHNICAL CHARACTERISTICS	SCALE NAME	
	Vocational Attitude	Vocational Knowledge
Number of Items	26	30
Mean	48.71	14.93
Standard Deviation	8.82	4.70
Coefficient Alpha Reliability	.66	–
KR-20 Reliability	–	.71
Standard Error of Measurement	5.17	2.53
Average Inter-Item Correlation	.07	.08
Average Item Mean	1.87	–
Average Item Difficulty	–	.49

NOTE: Based on subsample of 2,885 7th grade students.

TABLE 33

SELECTED TECHNICAL CHARACTERISTICS OF GOAL VIII:
VOCATIONAL ATTITUDE AND KNOWLEDGE SCALES (GRADE 9)

TECHNICAL CHARACTERISTICS	SCALE NAME	
	Vocational Attitude	Vocational Knowledge
Number of Items	26	30
Mean	50.93	18.90
Standard Deviation	8.58	4.96
Coefficient Alpha Reliability	.67	—
KR-20 Reliability	—	.76
Standard Error of Measurement	4.90	2.43
Average Inter-Item Correlation	.07	.10
Average Item Mean	1.96	—
Average Item Difficulty	—	.63

NOTE: Based on subsample of 3,017 9th grade student.

GOAL IX: APPRECIATING HUMAN ACCOMPLISHMENTS

Goal Statement

Quality education should help every child to understand and appreciate as much as he can of human achievement in the natural sciences, the social sciences, the humanities and the arts.

Goal Rationale

Students should be encouraged and helped to gain knowledge about human accomplishments. Possessing knowledge they will then be ready to receive and not to avoid the stimuli that the sciences and arts provide. At the next level, they will be ready to more clearly and consciously perceive these stimuli and will begin to discriminate among art forms. When they reach the next stage of development, they will be ready to respond rather than merely attend to phenomenon – they will choose to see a play, to read of a famous scientist or to contemplate the design of a building.

Insofar as possible the school experience should provide an increasing openness to the life of the mind and an increasing ability to find meaning for one's own life in the heritage of the past and in the intellectual thrusts of the present age.

Measurement Rationale

Attitudes associated with the understanding and appreciation of human accomplishments may be inferred from samplings of behavior taken at several points along a response hierarchy. The lowest point in the hierarchy is represented by those behaviors indicative of a state of passive receptivity reflecting little more than an awareness that certain human endeavors exist. At the highest point of this hierarchy are those overt behaviors resulting in direct involvement in the activities and which infer a state of high motivation. Between these two extremes are several intermediate steps based on the *"value"* placed on the activities and willingness to *"receive"* stimuli that these activities provide

In developing the assessment model to be used in this goal area it was determined that the instrument would not attempt to sample behaviors at either extreme. Instead items were designed to concentrate on attitudes concerned with the degree of value placed by students on various areas of human accomplishment and the willingness of students to seek out environments where first hand experience in these endeavors would be possible.

General Scale Description

This scale contains 46 items measuring how much value the students place on human achievements in the arts and sciences and the degree to which they are willing to receive stimuli that these endeavors provide. Areas included are literature, art, athletics, politics, science, music and drama. The scale is organized into two subscales each having 23 items.

Subscale 1:

Valuing measures the amount of importance the student attaches to achievements in the arts and sciences and how much the student values the role played by people in these areas. Sample item: *"Most scientists are interested only in machines, not people."*

Subscale 2:

Receiving measures willingness to learn more about achievements in the arts and sciences and to seek out experiences which provide first-hand information on what people in these areas are doing. Sample item: *"It would be fun to watch people paint at an art studio."*

Norm-Referenced Scoring

The item weighting scheme used for norm-referenced scoring is:

	Response Options		
Item Direction	Agree	Uncertain	Disagree
Plus	2	1	0
Minus	0	1	2

*The appreciating human accomplishments scale is a result of extensive revisions of the Goal IX instrument used for grade 11. Nolan F. Russell from the Division of Educational Quality Assessment was responsible for the revisions.

Criterion-Referenced Scoring

Responses to this scale are considered favorable when they reflect agreement with statements which (1) stress the value of human endeavors in the arts, sciences, politics, etc., or (2) suggest that it is personally rewarding to approach the people and places associated with these endeavors. For the appreciation of human accomplishments scale the following scoring scheme is used.

	Response Choices		
Item Direction	Agree	Uncertain	Disagree
Plus Statements	1	0	0
Minus Statements	0	0	1

Each student's score is then compared to a standard having three levels. To meet level one the student must respond favorably to more than 35 per cent of the items. To meet level two the student must respond favorably to more than 51 per cent of the items. Level three requires the student to choose favorable response choices to more than 70 per cent of the items.

Technical Properties

This scale has the highest grade level readability (7.7) of all scales contained in EQAI. Internal consistency reliabilities computed separately for low, average and high achiever students were found to be .82, .86 and .88 at grade 7 and .85, .88 and .89 at grade 9. The receiving and valuing subscales were found to be .56 at grade 7 and .64 at grade 9.

Tables 34 and 35 present selected technical characteristics associated with norm-referenced scoring for grades 7 and 9 respectively. Table 36 gives the reliabilities computed for both grades at each of three criterion-levels. Table 36 shows the proportion of students meeting each criterion level.

TABLE 34

SELECTED TECHNICAL CHARACTERISTICS FOR GOAL IX:
APPRECIATION OF HUMAN ACCOMPLISHMENTS SCALE (GRADE 7)

TECHNICAL CHARACTERISTIC	SUBSCALE NAME		
	Valuing	Receiving	Total Scale
Number of Items	23	23	46
Mean	30.69	26.41	57.11
Standard Deviation	6.49	8.15	12.94
Skewness	-.18	-.04	-.01
Kurtosis	-.36	-.21	-.20
Guttman's LAMBDA - 3 Reliability	.80	.86	.89
Coefficient Alpha Reliability	.74	.82	.86
Standard Error of Measurement	3.32	3.44	4.85
Average Inter - Item Correlation	.11	.17	.12
Average Item Mean	1.33	1.15	1.24

NOTE: Based on subsample of 2,883 7th grade students.
Inter-correlation between above two subscales was found to be .56.

TABLE 35

SELECTED TECHNICAL CHARACTERISTICS FOR GOAL IX:
APPRECIATION OF HUMAN ACCOMPLISHMENTS SCALE (GRADE 9)

TECHNICAL CHARACTERISTIC	SUBSCALE NAME		
	Valuing	Receiving	Total Scale
Number of Items	23	23	46
Mean	31.28	25.20	56.48
Standard Deviation	6.52	8.67	13.80
Skewness	-.32	-.01	-.06
Kurtosis	-.27	-.32	-.26
Guttman's LAMBDA - 3 Reliability	.81	.88	.91
Coefficient Alpha Reliability	.75	.84	.88
Standard Error of Measurement	3.28	3.45	4.81
Average Inter-Item Correlation	.11	.19	.11
Average Item Mean	1.36	1.10	1.23

NOTE: Based on subsample of 3,008 9th grade students.

TABLE 36

CRITERION-REFERENCED RELIABILITY AND PROPORTION OF STUDENTS EXCEEDING EACH OF THREE CRITERION LEVELS: APPRECIATION OF HUMAN ACCOMPLISHMENTS (GRADES 7 AND 9)

		CRITERION LEVELS					
		Level One		Level Two		Level Three	
GRADE	SUBSCALE NAME	Prop. Passing	Relia-bility	Prop. Passing	Relia-bility	Prop. Passing	Relia-bility
7	Valuing	.80	.86	.56	.65	.17	.92
7	Receiving	.59	.80	.34	.83	.09	.97
7	Total Scale	.75	.91	.42	.86	.11	.96
9	Valuing	.83	.88	.62	.77	.20	.90
9	Receiving	.56	.81	.32	.86	.09	.98
9	Total Scale	.76	.91	.42	.87	.12	.97

GOAL X: PREPARING FOR A CHANGING WORLD

Goal Statement

Quality education should help every child to prepare for a world of rapid change and unforeseeable demands in which continuing education throughout his adult life should be a normal expectation.

Goal Rationale

Ability to cope with a rapidly changing world is an attribute of increasing importance for today's youth. The development of the abilities and their associated attitudes which allow the individual to view change as an opportunity rather than a threat poses a new challenge for education.

Schools should help students develop attitudes of openness to the possibilities of change – change in their personal world as well as external change. Students should be encouraged to show tolerance for ambiguity and to welcome new experiences.

Measurement Rationale

Coping with change and the ability to deal effectively with frustration are essential ingredients in a concept involving personal adjustment. These adaptive behaviors are seldom learned in response to external changes of great magnitude and import but are acquired as part of a gradual process requiring daily changes in the life of the student.

Assessment in this goal area attempts to draw upon several constructs believed to be associated with a student's ability to accommodate change and to adapt emotionally and behaviorally to unexpected or sudden alterations in the environment. Primary among these are measures of the student's ability to tolerate frustration, ambiguity and uncertainty and to apply past learnings and coping behaviors in new and different situations.

The situational contexts selected as a means of measuring these attitudinal and behavioral dimensions were gleaned from student responses to open-ended questions asking for descriptions of events they had experienced which necessitated some form of adjusting behavior and which were remembered as being difficult to cope with.

General Scale Description*

Thirty-five items measure emotional and behavioral reactions to change. The scale's format contains seven stories describing unpleasant change situations in which students' expectations or needs are not met. These situations were obtained from previous student statements describing events that were difficult to adjust to. Five reactions predefined as indicating positive or negative adaptation to change are given following each story. The purpose of the scale is to get at student reactions in response to a variety of events, not to predict what students will do in the particular situations presented.

Sample items:

I was elected class president. I came home to tell my parents the good news. They told me that my dad had taken a job out of state and we were going to move in two weeks. So I had to withdraw from school and move.

If this happened to you, how much *time* would you spend on each thing listed below:

	A Great Deal of Time	Some Time	Very Little Time	No Time
1. Getting over being upset.				
2. Trying to find someone to stay with so I could remain in my school.				
3. Planning a going-away party.				
4. Fighting with my parents.				
5. Reading about the place we are going to move to.				

This scale contains three subscales designed to delineate various behaviors and emotional reactions to frustration.

*The preparing for a changing world scale was authored by Nolan F. Russell, Division of Educational Quality Assessment.

Subscale 1:

Effective solutions contains 13 items to measure the tendency to try solutions reflecting positive adjustment to change. In the above, sample items three and five are assigned to this subscale.

Subscale 2:

Ineffective solutions contains 13 items to measure tendency to avoid use of aggressive or withdrawing reactions in face of change. In the above, sample items two and four are assigned to this subscale.

Subscale 3:

Emotional adjustment contains nine items to measure the perception of the length of time needed for the student to adjust emotionally to change. Item one above is assigned to this subscale.

Norm-Referenced Scoring

The item weighting scheme for norm-referenced scoring is:

	Response Options			
Types of Items	No Time	Little Time	Some Time	A Great Deal of Time
Effective Solutions	0	1	2	3
Ineffective Solutions	3	2	1	0
Emotional Adjustment	2	2	1	0

Criterion-Referenced Scoring

Responses are considered *"favorable"* when they reflect (1) a willingness to display positive adjustment behaviors, (2) an unwillingness to use withdrawal or aggressive actions and (3) a rapid emotional adjustment to change. An individual's score on a given scale (total or subscale) is the percentage of items to which a favorable response was given. The item weighting scheme for the preparing for a changing world scale is as follows:

	Response Choices			
Item Type	A Great Deal of Time	Some Time	Very Little Time	No Time
Effective Solution	1	1	0	0
Ineffective Solution	0	0	1	1
Emotional Adjustment	0	0	1	1

Each student's score is then compared to a given standard having three levels. To meet level one the student must respond favorably to more than 35 per cent of the items. To meet level two the student must respond favorably to more than 51 per cent of the items. Level three requires the student to choose favorable response choices to more than 70 per cent of the items.

Technical Properties

The grade level readability for the story component of this scale is 5.5. The items have a grade level readability of 4.0. Coefficient alphas for the total scale computed across low, average and high achiever groups as defined by scores on the composite math-verbal tests were .77, .82 and .85 at grade 7 and .76, .80 and .83 at grade 9.

Tables 36 and 37 present selected norm-referenced technical characteristics of the preparing for a changing world scale for grade 7 and 9 respectively. Tables 39 and 40 show the intercorrelations between the subscales. Table 41 gives the internal consistency reliability estimates associated with each of the criterion levels and shows the proportion of students meeting each criterion.

TABLE 36

SELECTED TECHNICAL CHARACTERISTICS OF GOAL X:
PREPARING FOR A CHANGING WORLD (GRADE 7)

TECHNICAL CHARACTERISTIC	SUBSCALE NAME			
	Effective Solutions	Ineffective Solutions	Emotional Adjustment	Total Scale
Number of Items	13	13	9	35
Mean	23.90	25.14	13.32	62.35
Standard Deviation	5.91	7.86	4.88	13.25
Skewness	-.36	-.37	.18	-.19
Kurtosis	.09	-.44	-.09	-.14
Guttman's LAMBDA - 3 Reliability	.73	.85	.75	.84
Coefficient Alpha Reliability	.68	.83	.70	.82
Standard Error of Measurement	3.33	3.23	2.66	5.67
Average Inter-Item Correlation	.14	.28	.21	.11
Average Item Mean	1.84	1.93	1.48	1.78

NOTE: Based on subsample of 2,874 7th grade students.

TABLE 37

SELECTED TECHNICAL CHARACTERISTICS OF GOAL X:
PREPARING FOR A CHANGING WORLD (GRADE 9)

TECHNICAL CHARACTERISTIC	SUBSCALE NAME			
	Effective Solutions	Ineffective Solutions	Emotional Adjustment	Total Scale
Number of Items	13	13	9	35
Mean	22.57	25.93	13.97	62.46
Standard Deviation	5.99	7.24	4.77	12.42
Skewness	-.38	-.37	.22	-.21
Kurtosis	.16	-.32	-.12	.21
Guttman's LAMBDA-3 Reliability	.75	.83	.76	.83
Coefficient Alpha Reliability	.70	.81	.71	.80
Standard Error of Measurement	3.28	3.17	2.56	5.55
Average Inter-Item Correlation	.15	.25	.22	.10
Average Item Mean	1.74	1.99	1.55	1.79

NOTE: Based on subsample of 3,012 9th grade students.

TABLE 38

CORRELATION MATRIX BETWEEN SUBSCALES FOR PREPARING FOR A CHANGING WORLD SCALE: GRADE 7

	SUBSCALE NAME	
SUBSCALE NAME	Effective Solution	Ineffective Solutions
Ineffective Solutions	.31	
Emotional Adjustment	-.07	.40

TABLE 39

CORRELATION MATRIX BETWEEN SUBSCALES FOR PREPARING FOR A CHANGING WORLD SCALE: GRADE 9

	SUBSCALE NAME	
SUBSCALE NAME	Effective Solution	Ineffective Solution
Ineffective Solutions	.31	
Emotional Adjustment	-.12	.34

TABLE 40

CRITERION-REFERENCED RELIABILITY AND PROPORTION OF STUDENTS EXCEEDING EACH OF THREE CRITERION LEVELS: PREPARING FOR A CHANGING WORLD (GRADES 7 AND 9)

		CRITERION LEVELS					
		Level One		Level Two		Level Three	
GRADE	SUBSCALE NAME	Prop. Passing	Reliability	Prop. Passing	Reliability	Prop. Passing	Reliability
7	Effective Solutions	.93	.93	.79	.77	.42	.73
7	Ineffective Solutions	.89	.96	.74	.85	.45	.83
7	Emotional Adjustment	.60	.68	.44	.71	.19	.94
7	Total Scale	.94	.96	.76	.85	.32	.85
9	Effective Solutions	.91	.92	.75	.74	.36	.79
9	Ineffective Solutions	.92	.97	.80	.85	.47	.79
9	Emotional Adjustment	.63	.70	.47	.70	.21	.93
9	Total Scale	.96	.96	.79	.85	.31	.83

SECTION THREE

Target Groups for Program Focus

Ideally, when preparing to initiate a program to facilitate student progress in any goal area, one should be able to identify students most likely to benefit from that program. However, information available to schools participating in Pennsylvania's Educational Quality Assessment program does not contain data on individual students. Consequently, it is impossible for school personnel to identify by name the members of the target group toward which a program might be focused.

Even though individual records are unavailable, it is possible to organize data in such a way as to help identify general student groups having difficulty in a goal area.

This was done by summarizing data for various subgroups of students formed from selected student characteristics. The three student characteristics used in these analyses were ability level, sex and father's occupation.

Student ability was categorized into three levels on the basis of the composite math-verbal achievement score. Students scoring below the 30th percentile were placed in the low ability group. Students scoring between the 30th and 70th percentile were placed in the middle ability group. Those exceeding the 70th percentile were assigned to the high ability group.

Students were assigned to three groups on the basis of their reported father's or legal guardian's occupation. These occupation categories are labeled for convenience as semi-skilled, skilled and professional. These categories are abstractions based upon the average educational requirements necessary to obtain the job and the average amount of compensation for the particular occupations. It is recognized here that there are exceptions in any or all of these categories. The semi-skilled occupational category includes hospital attendant, laborer, operator of industrial equipment, packer, wrapper, miner, quarry worker, painter, roofer, paperhanger, carpet layer, truck driver, taxi driver, service station attendant, watchman, barber, waiter, cook, farmer and carpenter.

The skilled occupational category includes cabinetmaker, dental technician, nurse, librarian, foreman, toolmaker, machinist, electrician, plumber, bricklayer, stonemason, heavy equipment operator, mail carrier, telephone operator, printer, decorator, policeman, firefighter, repairman, butcher, mechanic, tailor, forester, secretary, clerk, office worker, salesperson, grocer and minister.

The professional occupational category includes dentist, doctor, veterinarian, architect, pilot, teacher, school administrator, editor, farm agent, stockbroker, insurance agent, real estate agent, personnel manager, bank official, lawyer, judge, engineer, social scientist and natural scientist.

Eighteen groups were formed by taking all possible combinations of the three student characteristics. The proportion of students who responded favorably to more than one-half of the items comprising each scale was then found. Tables 43 through 51 present the results of these analyses.

How to interpret these tables:

Table 43 gives the percentage of students who met or exceeded the level two (51 per cent) criterion for the total self-esteem instrument. Note that 56 per cent of the 7th grade, low ability boys coming from homes where the father or guardian has a relatively low paying, low-skill occupation can meet the criterion. This can be contrasted to the finding that 87 per cent of the 7th grade girls, scoring high on the math-verbal scales and coming from homes where parents have professional occupations can meet the criterion. These results suggest that a program aimed at the former group will reach more students who need help in enhancing their self-esteem.

TABLE 43

PER CENT OF STUDENTS SHOWING POSITIVE ATTITUDE:
SELF-ESTEEM (GRADES 7-9)

TYPE OF STUDENTS			GRADE LEVEL 7	9
Low ability	Boys	Semi-skilled fathers	56%	59%
Low ability	Girls	Semi-skilled fathers	56%	61%
Low ability	Boys	Skilled fathers	55%	60%
Low ability	Girls	Skilled fathers	66%	63%
Low ability	Boys	Professional fathers	69%	62%
Low ability	Girls	Professional fathers	64%	75%
Middle ability	Boys	Semi-skilled fathers	66%	72%
Middle ability	Girls	Semi-skilled fathers	67%	74%
Middle ability	Boys	Skilled fathers	71%	78%
Middle ability	Girls	Skilled fathers	73%	70%
Middle ability	Boys	Professional fathers	80%	75%
Middle ability	Girls	Professional fathers	74%	78%
High ability	Boys	Semi-skilled fathers	74%	86%
High ability	Girls	Semi-skilled fathers	74%	76%
High ability	Boys	Skilled fathers	85%	86%
High ability	Girls	Skilled fathers	83%	83%
High ability	Boys	Professional fathers	83%	87%
High ability	Girls	Professional fathers	87%	83%

Clearly, in today's world, women are playing an increasingly important role in defining the occupational level of the family. However, data were unavailable to reflect this trend. Therefore, we are forced to use the father's occupational level as a proxy for the socioeconomic condition of the home.

TABLE 44

PER CENT OF STUDENTS SHOWING POSITIVE ATTITUDE:
TOLERANCE TOWARD OTHERS (GRADES 7-9)

TYPE OF STUDENTS			GRADE LEVEL 7	9
Low ability	Boys	Semi-skilled fathers	68%	69%
Low ability	Girls	Semi-skilled fathers	80%	83%
Low ability	Boys	Skilled fathers	74%	72%
Low ability	Girls	Skilled fathers	80%	85%
Low ability	Boys	Professional fathers	61%	70%
Low ability	Girls	Professional fathers	68%	91%
Middle ability	Boys	Semi-skilled fathers	74%	78%
Middle ability	Girls	Semi-skilled fathers	84%	95%
Middle ability	Boys	Skilled fathers	71%	80%
Middle ability	Girls	Skilled fathers	83%	92%
Middle ability	Boys	Professional fathers	88%	82%
Middle ability	Girls	Professional fathers	87%	93%
High ability	Boys	Semi-skilled fathers	77%	93%
High ability	Girls	Semi-skilled fathers	87%	94%
High ability	Boys	Skilled fathers	81%	79%
High ability	Girls	Skilled fathers	93%	97%
High ability	Boys	Professional fathers	83%	87%
High ability	Girls	Professional fathers	92%	98%

Clearly, in today's world, women are playing an increasingly important role in defining the occupational level of the family. However, data were unavailable to reflect this trend. Therefore, we are forced to use the father's occupational level as a proxy for the socioeconomic condition of the home.

TABLE 45

PER CENT OF STUDENTS SHOWING POSITIVE ATTITUDE:
INTEREST IN SCHOOL (GRADES 7-9)

TYPE OF STUDENTS			GRADE LEVEL 7	9
Low ability	Boys	Semi-skilled fathers	50%	53%
Low ability	Girls	Semi-skilled fathers	67%	61%
Low ability	Boys	Skilled fathers	56%	54%
Low ability	Girls	Skilled fathers	74%	63%
Low ability	Boys	Professional fathers	64%	56%
Low ability	Girls	Professional fathers	68%	61%
Middle ability	Boys	Semi-skilled fathers	61%	66%
Middle ability	Girls	Semi-skilled fathers	73%	76%
Middle ability	Boys	Skilled fathers	68%	67%
Middle ability	Girls	Skilled fathers	73%	67%
Middle ability	Boys	Professional fathers	76%	71%
Middle ability	Girls	Professional fathers	77%	67%
High ability	Boys	Semi-skilled fathers	75%	74%
High ability	Girls	Semi-skilled fathers	68%	79%
High ability	Boys	Skilled fathers	76%	77%
High ability	Girls	Skilled fathers	82%	87%
High ability	Boys	Professional fathers	79%	78%
High ability	Girls	Professional fathers	85%	73%

Clearly, in today's world, women are playing an increasingly important role in defining the occupational level of the family. However, data were unavailable to reflect this trend. Therefore, we are forced to use the father's occupational level as a proxy for the socioeconomic condition of the home.

TABLE 46

PER CENT OF STUDENTS SHOWING POSITIVE ATTITUDE:
CITIZENSHIP (GRADES 7-9)

TYPE OF STUDENTS			GRADE LEVEL 7	9
Low ability	Boys	Semi-skilled fathers	13%	13%
Low ability	Girls	Semi-skilled fathers	19%	28%
Low ability	Boys	Skilled fathers	9%	11%
Low ability	Girls	Skilled fathers	32%	28%
Low ability	Boys	Professional fathers	19%	22%
Low ability	Girls	Professional fathers	27%	30%
Middle ability	Boys	Semi-skilled fathers	20%	18%
Middle ability	Girls	Semi-skilled fathers	47%	46%
Middle ability	Boys	Skilled fathers	28%	23%
Middle ability	Girls	Skilled fathers	39%	35%
Middle ability	Boys	Professional fathers	36%	24%
Middle ability	Girls	Professional fathers	51%	32%
High ability	Boys	Semi-skilled fathers	37%	38%
High ability	Girls	Semi-skilled fathers	50%	51%
High ability	Boys	Skilled fathers	49%	30%
High ability	Girls	Skilled fathers	56%	51%
High ability	Boys	Professional fathers	43%	27%
High ability	Girls	Professional fathers	51%	45%

Clearly, in today's world, women are playing an increasingly important role in defining the occupational level of the family. However, data were unavailable to reflect this trend. Therefore, we are forced to use the father's occupational level as a proxy for the socioeconomic condition of the home.

TABLE 47

PER CENT OF STUDENTS SHOWING POSITIVE ATTITUDE:
HEALTH HABITS (GRADES 7-9)

TYPE OF STUDENTS			GRADE LEVEL 7	9
Low ability	Boys	Semi-skilled fathers	20%	28%
Low ability	Girls	Semi-skilled fathers	30%	37%
Low ability	Boys	Skilled fathers	18%	27%
Low ability	Girls	Skilled fathers	39%	36%
Low ability	Boys	Professional fathers	29%	25%
Low ability	Girls	Professional fathers	35%	39%
Middle ability	Boys	Semi-skilled fathers	31%	44%
Middle ability	Girls	Semi-skilled fathers	52%	61%
Middle ability	Boys	Skilled fathers	45%	41%
Middle ability	Girls	Skilled fathers	54%	49%
Middle ability	Boys	Professional fathers	60%	47%
Middle ability	Girls	Professional fathers	57%	43%
High ability	Boys	Semi-skilled fathers	53%	51%
High ability	Girls	Semi-skilled fathers	55%	60%
High ability	Boys	Skilled fathers	61%	52%
High ability	Girls	Skilled fathers	64%	58%
High ability	Boys	Professional fathers	58%	52%
High ability	Girls	Professional fathers	63%	57%

Clearly, in today's world, women are playing an increasingly important role in defining the occupational level of the family. However, data were unavailable to reflect this trend. Therefore, we are forced to use the father's occupational level as a proxy for the socioeconomic condition of the home.

TABLE 48

PER CENT OF STUDENTS SHOWING POSITIVE ATTITUDES:
CREATIVE ACTIVITIES (GRADES 7-9)

TYPE OF STUDENTS			GRADE LEVEL 7	9
Low ability	Boys	Semi-skilled fathers	80%	59%
Low ability	Girls	Semi-skilled fathers	71%	57%
Low ability	Boys	Skilled fathers	77%	64%
Low ability	Girls	Skilled fathers	73%	60%
Low ability	Boys	Professional fathers	73%	58%
Low ability	Girls	Professional fathers	67%	66%
Middle ability	Boys	Semi-skilled fathers	62%	53%
Middle ability	Girls	Semi-skilled fathers	68%	61%
Middle ability	Boys	Skilled fathers	62%	51%
Middle ability	Girls	Skilled fathers	67%	52%
Middle ability	Boys	Professional fathers	69%	62%
Middle ability	Girls	Professional fathers	67%	61%
High ability	Boys	Semi-skilled fathers	58%	55%
High ability	Girls	Semi-skilled fathers	69%	65%
High ability	Boys	Skilled fathers	68%	57%
High ability	Girls	Skilled fathers	74%	67%
High ability	Boys	Professional fathers	64%	52%
High ability	Girls	Professional fathers	75%	61%

Clearly, in today's world, women are playing an increasingly important role in defining the occupational level of the family. However, data were unavailable to reflect this trend. Therefore, we are forced to use the father's occupational level as a proxy for the socioeconomic condition of the home.

TABLE 49

PER CENT OF STUDENTS SHOWING POSITIVE ATTITUDE:
VOCATIONAL DEVELOPMENT (GRADES 7-9)

TYPE OF STUDENTS			GRADE LEVEL 7	9
Low ability	Boys	Semi-skilled fathers	68%	81%
Low ability	Girls	Semi-skilled fathers	63%	85%
Low ability	Boys	Skilled fathers	72%	80%
Low abili y	Girls	Skilled fathers	78%	86%
Low ab lity	Boys	Professional fathers	79%	84%
Low ability	Girls	Professional fathers	78%	82%
Middle ability	Boys	Semi-skilled fathers	87%	90%
Middle ability	Girls	Semi-skilled fathers	83%	90%
Middle ability	Boys	Skilled fathers	82%	92%
Middle ability	Girls	Skilled fathers	93%	94%
Middle ability	Boys	Professional fathers	94%	85%
Middle ability	Girls	Professional fathers	94%	91%
High ability	Boys	Semi-skilled fathers	92%	92%
High ability	Girls	Semi-skilled fathers	90%	95%
High ability	Boys	Skilled fathers	93%	89%
High ability	Girls	Skilled fathers	94%	94%
High ability	Boys	Professional fathers	88%	91%
High ability	Girls	Professional fathers	91%	94%

Clearly, in today's world, women are playing an increasingly important role in defining the occupational level of the family. However, data were unavailable to reflect this trend. Therefore, we are forced to use the father's occupational level as a proxy for the socioeconomic condition of the home.

TABLE 50

PER CENT OF STUDENTS SHOWING POSITIVE ATTITUDE:
APPRECIATING HUMAN ACCOMPLISHMENTS (GRADES 7-9)

TYPE OF STUDENTS			GRADE LEVEL 7	9
Low ability	Boys	Semi-skilled fathers	28%	22%
Low ability	Girls	Semi-skilled fathers	40%	37%
Low ability	Boys	Skilled fathers	18%	21%
Low ability	Girls	Skilled fathers	40%	41%
Low ability	Boys	Professional fathers	23%	16%
Low ability	Girls	Professional fathers	33%	48%
Middle ability	Boys	Semi-skilled fathers	23%	31%
Middle ability	Girls	Semi-skilled fathers	49%	54%
Middle ability	Boys	Skilled fathers	34%	24%
Middle ability	Girls	Skilled fathers	48%	52%
Middle ability	Boys	Professional fathers	47%	42%
Middle ability	Girls	Professional fathers	55%	48%
High ability	Boys	Semi-skilled fathers	30%	43%
High ability	Girls	Semi-skilled fathers	57%	66%
High ability	Boys	Skilled fathers	48%	45%
High ability	Girls	Skilled fathers	65%	61%
High ability	Boys	Professional fathers	47%	47%
High ability	Girls	Professional fathers	64%	71%

Clearly, in today's world, women are playing an increasingly important role in defining the occupational level of the family. However, data were unavailable to reflect this trend. Therefore, we are forced to use the father's occupational level as a proxy for the socioeconomic condition of the home.

TABLE 51

PER CENT OF STUDENTS SHOWING POSITIVE ATTITUDE: PREPARING FOR A CHANGING WORLD (GRADES 7-9)

TYPE OF STUDENTS			GRADE LEVEL 7	9
Low ability	Boys	Semi-skilled fathers	66%	66%
Low ability	Girls	Semi-skilled fathers	64%	75%
Low ability	Boys	Skilled fathers	63%	69%
Low ability	Girls	Skilled fathers	72%	75%
Low ability	Boys	Professional fathers	65%	74%
Low ability	Girls	Professional fathers	77%	79%
Middle ability	Boys	Semi-skilled fathers	67%	75%
Middle ability	Girls	Semi-skilled fathers	81%	83%
Middle ability	Boys	Skilled fathers	75%	78%
Middle ability	Girls	Skilled fathers	84%	82%
Middle ability	Boys	Professional fathers	83%	81%
Middle ability	Girls	Professional fathers	82%	84%
High ability	Boys	Semi-skilled fathers	80%	78%
High ability	Girls	Semi-skilled fathers	84%	82%
High ability	Boys	Skilled fathers	79%	82%
High ability	Girls	Skilled fathers	83%	88%
High ability	Boys	Professional fathers	86%	89%
High ability	Girls	Professional fathers	87%	85%

Clearly, in today's world, women are playing an increasingly important role in defining the occupational level of the family. However, data were unavailable to reflect this trend. Therefore, we are forced to use the father's occupational level as a proxy for the socioeconomic condition of the home.

SECTION FOUR

Relationships among Scales

The EQAI contains 12 major composite scales designed to measure student growth in the 10 state mandated goal areas. Associated with these total scales are 26 subscales which further clarify student strengths or weaknesses relative to specific points of interest within these areas. In addition, the EQAI contains two sets of items designed to (1) assess the tendency of students to make themselves *"look good"* and (2) to measure students' perception of the home environment. The former item-set, called the social desirability scale, contains nine items and has a reliability of .58 at grade 7 and .62 at grade 9. High scores on this scale indicate the tendency to choose socially desirable responses.

The individual technical characteristics of each total and subscale which have been presented in Section Two would be sufficient if each scale were administered separately. However, these instruments are contained and administered as a battery rather than in single units. It therefore becomes necessary to know the independence of each scale. Is each of the scales providing relevant information which is not provided by the other scales? How independent are the scales from one another?

Tables 52 and 53 show the correlation matrix between all scale and subscale scores based on norm-referenced scoring for the 7th and 9th grade subsamples respectively. These correlations have been rounded to two decimal places and the decimal has been removed. A correlation greater than .18 is statistically significant at the .01 level of probability.

Of primary interest are the coefficients located in column two of each table which present the correlations between scores on the social desirability scale and all other sub and total scales. That the correlations are quite small indicates the scales are relatively free from this type of response bias.

Of additional interest are the coefficients located in column one (both tables) which show the correlations between student perception of home climate and the other sub and total scales. The home climate scale contains eight items and has a reliability of .81 at grade 7 and .84 at grade 9. This scale is scored such that a higher value indicates the student is more satisfied with his/her relationship with parents and home conditions.

Factor Analyses

The interrelationships between the various total and subscales contained in the EQAI were further investigated by a factor analysis. At the outset principal components analyses were performed on the grade 7 and 9 correlation data. Total scales which were composites of several subscales were excluded from consideration. These analyses were followed by varimax rotation. The various results of the seven factor solution for each grade level are presented in Tables 54 through 57. Tables 54 and 55 present the correlations of each subscale to each of the seven factors. These correlations are called factor loadings. On these tables the highest factor loadings are highlighted by a box drawn around them.

The columns in Table 56 labeled Per Cent of Trace show the proportion of total variability associated with all these subscales that can be accounted for by each of the seven factors. The seven factor solution can account for 60.2 per cent and 61.5 per cent of the total variance at grade 7 and 9.

Great similarity exists between the grade 7 and grade 9 factor structure (Tables 54 and 55), thereby permitting a description of the results which apply to both grade levels. Factor 1, accounting for approximately 13 per cent of the variance, appears to be composed of citizenship (Goal V) and health (Goal VI) subscales. The creativity (Goal VII) subscales load most highly on Factor 2 which accounts for about nine per cent of the variance. Factor 3 composition is that of self esteem (Goal I), accounting for about eight per cent of the variance. The understanding others (Goal II) subscales comprise Factor 4 which accounts for about 10 per cent of the variance. Factors 5 and 6 are reversed at the two grade levels. Note that Factor 5 at grade 7 is essentially like Factor 6 at grade 9. In each case the highest loadings occur across goal instruments rather than within as in the other factors. Emotional adjustment (a Goal X subscale) and vocational attitude (the Goal VIII-A attitude scale) have the highest loadings for Factor 5 (grade 7) and Factor 6 (grade 9). Factor 6 at grade 7 and Factor 5 at grade 9 both reveal high loadings for Goals III (verbal analogies and mathematical reasoning) and Goal VIII-K (knowledge). These factors are considered to reflect cognitive dimensions and account for about five per

cent of the variance. Factor 7, accounting for about eight per cent of the variance, is characterized by high loadings on the attitude toward school subscales (Goal IV) and appreciating human accomplishments subscales (Goal IX).

The fact that the highest loadings generally occurred for the subscales within a goal area indicate that these subscales have higher correlations among themselves than with subscales in other goal areas.

Table 57 shows the amount of variance accounted for in each subscale by all seven factors. Note that only one-third of the variance associated with the social desirability scale can be accounted for by these seven factors, indicating that this type of response bias is not a large factor in determining scores on the other EQAI scales.

Summary of Factor Analyses

The factor analyses were conducted to determine the ways that the individual scales in the EQAI cluster with one another. Ideally, 10 factors should be found, each containing subscales in only one goal area. To yield these results each set of subscales designed to measure a particular goal area would relate more strongly to one another than to any other single subscale or set of subscales. It could then be concluded that each goal instrument was capable of giving unique information and further that each goal area reflected unique traits possessed by individuals.

The results of the factor analyses suggest that the above conclusions are not completely tenable. Several goal instruments do seem independent from other scales in the EQAI. These are self-esteem, tolerance toward others, and creativity. Yet other subscales cluster across goal areas rather than within goal areas. The subscales in the interest in school and appreciating human accomplishments instruments form one cluster. Another cluster is formed by the citizenship and health habits scales. The instruments comprising each of these *"across goal"* clusters have similar response formats suggesting that part of this interdependence is due to the method used to measure these areas.

The health and citizenship instruments have identical formats: persons are asked to put themselves in a make-believe student's place and decide whether to take ideal actions under a variety of motivation-inducing conditions. The motivating conditions presented in both instruments are also highly similar

The interest in school and appreciating human accomplishments scales likewise have similar response formats. Each scale requires the respondent to respond on an agree-disagree continuum. In certain cases the items contained in each of these scales are similar. For example, an item in Goal IV states *"studying is a waste of time"* and a Goal IX item says *"reading novels is a waste of time."*

It should be noted at this point that the health and citizenship items as well as the interest in school and appreciation of human accomplishments items were subjected to another factor analysis prior to entry into the battery. ,These item analyses, as opposed to the aforementioned subscale analyses revealed that the citizenship items clustered independently from the health items and the interest in school items clustered independently from the appreciation of human accomplishments items. This independence can occur because of the difference in context–the item analyses compared items from two scales. The other factor analysis compared scores on subscales in the larger framework of the entire test battery of 26 subscales hence a given subscale had more opportunities to cluster.

Another clustering of instruments in the EQAI occurs between the math and verbal achievement tests, the vocational knowledge test, and the social desirability scale. This cluster is a cognitive or knowledge component of the battery. The inclusion of the social desirability instrument in this cluster suggests that this scale might be more reflective of reading ability than the tendency to give favorable answers. A typical item in the social desirability scale is: *"I am always willing to admit when I have made a mistake."* A student answering *"very much like me"* is given a high score on social desirability. However the choice of this response could simply result from the student glossing over the key word in the item which is always.

Factor 5 of grade 7 and Factor 6 of grade 9 are the most complex clusters. These clusters contain subscales from five separate goal instruments. Those subscales that appear to be related in these factors include drugs, writing, vocational attitude, receiving and emotional adjustment. The negative factor loading associated with the Goal VIII-A (vocational attitude) scale suggests that students with more favorable vocational attitudes respond less favorably to the other four subscales. This relationship is consistent across grade levels and deserves further study.

In addition to identifying major clusters of instruments comprising the EQAI, the factor analysis reveals several interesting relationships between some subscales and factors. The concern for welfare and dignity of others subscale contained in the citizenship instrument relates quite strongly with the tolerance toward others cluster. The former scale measures student willingness to go to the aid of others in distress, to permit others into the group and to refrain from actions that might degrade another person. The subscales found in the tolerance toward others instrument measures the amount of comfort experienced by students when coming into contact with differing others.

Another relationship of interest is that between the drug subscale contained in the health instrument and the cognitive cluster containing the math, verbal and vocational knowledge scales. This suggests that some students may be given undesirable answers to the drug items because they do not know that several of the listed practices are dangerous. Another hypothesis would be that *"poorer"* students have less desirable drug habits due to social conditions. This latter hypothesis seems less tenable in the light of the fact that the other two subscales contained in the health instrument (i.e. safety and personal health) do not relate to the cognitive cluster.

TABLE 52 CORRELATION MATRIX BETWEEN EQAI SCALES AND SUBSCALES (Grade 7)

NUMBER	NAME	SUB AND TOTAL SCALES
1	Home Climate	
2	Social Desirability	17
3	Self Confidence	53 12
4	Control of Environment	45 09 52
5	Relations with Others	30 11 51 36
6	Image in School	44 13 53 51 40
7	Goal I - Total	06 15 84 74 72 80
8	Race Tolerance	08 04 04 16 08 12 13
9	Religion Tolerance	11 09 08 15 09 16 14 39
10	SES Tolerance	14 12 06 18 07 17 15 40 37
11	IQ Tolerance	15 10 07 17 05 12 13 35 29 41
12	Handicap Tolerance	16 11 09 22 09 15 01 29 28 37 38
13	Goal II - Total	17 13 10 24 11 20 23 73 65 72 67 42
14	Goal III - V	14 -15 16 36 10 19 25 [illegible]9 15 10 13 10 21
15	Goal III - M	10 -16 14 33 12 15 16 14 13 10 11 22 08 63
16	Learning Attitude	20 19 21 36 13 36 33 16 16 22 24 21 27 16 16
17	School Attitude	33 09 26 41 14 43 34 14 15 20 22 33 17 21 28 67
18	Goal IV - Total	33 13 25 41 15 43 42 17 15 21 25 12 34 22 14 88 82
19	Welfare - Dignity of Others	18 06 10 28 07 20 19 27 20 21 28 26 31 25 25 26 31 26
20	Law and Authority	22 09 12 26 01 23 20 18 11 16 22 17 [illegible] 34 35 64
21	Responsibility / Integrity	20 10 06 20 05 20 12 15 16 16 22 31 13 10 18 25 40 14 63 59
22	Goal V - Total	24 09 12 29 04 25 23 24 17 20 29 16 34 27 16 32 34 40 92 89 74
23	Personal Health	18 09 12 26 06 19 21 14 11 12 19 10 22 21 16 30 28 35 49 54 39 60
24	Safety	22 09 17 26 06 21 21 17 13 13 22 24 20 23 22 33 36 35 42 54 36 48 49
25	Drugs	24 -07 20 30 08 21 21 11 10 10 15 24 10 32 35 25 37 21 40 58 41 30 32 52
26	Goal VI - Total	25 05 20 33 09 26 30 18 12 15 23 06 30 34 24 35 32 46 48 56 28 61 62 79 55
27	Visual Arts	-02 12 00 -06 07 06 04 01 04 02 01 03 04 -17-1[illegible] 07 -02 04 -01 -02 -06 -00 00 -05 -10 -02
28	Performing Arts	-04 [illegible]-00 -07 06 02 02 01 05 -01 02 -00 03 -23-25 08 -00 03 00 -04 01 -02 -01 -[illegible] -11 -07 66
29	[illegible]cience	-04 10 -01 -07 05 03 00 -02 01 -04 -06 -02 -06 -20-[illegible]5 06 -02 -06 02 -05 06 -05 -03 -06 -09 -14 62 61
30	Writing	00 12 01 -02 05 10 03 04 07 00 01 11 -00 -15-10 10 10 -03 05 -02 18 -04 -02 02 09 -23 48 55 51
31	Goal VII - Total	-03 14 01 -05 09 08 05 01 06 02 01 -00 05 -18-19 10 00 08 -01 -03 -02 -01 00 -05 -[illegible]5 -04 84 85 71 59
32	Vocational Attitude	18 01 25 33 17 19 31 13 09 11 12 03 21 30 25 22 21 32 18 17 01 22 23 18 10 42 01 -05 -08 -02 01
33	Vocational Knowledge	13 -09 15 29 07 18 18 12 12 07 08 17 07 47 49 15 21 08 22 14 22 13 14 21 35 05 -19 -18 -01 13 -18 03
34	Valuing	29 00 22 39 16 33 33 22 18 25 25 24 30 32 30 40 46 40 34 31 33 36 29 30 24 29 -01 -05 02 09 -05 23 29
35	Receiving	17 12 07 16 07 23 15 14 13 21 21 25 22 33 02 36 35 31 24 23 32 24 18 17 25 04 14 14 08 34 17 -04 21 45
36	Goal IX - Total	25 06 17 32 15 31 31 22 19 27 28 18 38 28 17 44 40 52 29 31 20 39 30 24 14 42 11 06 -04 -08 12 34 00 76 62
37	Effective Solutions	23 09 11 11 09 21 20 10 07 18 21 18 18 10 10 36 34 36 23 29 25 29 24 24 20 [illegible] 01 -01 -04 01 01 10 10 24 24 31
38	Ineffective Solutions	33 04 24 31 13 27 31 18 14 17 18 14 23 23 20 30 38 33 31 36 31 40 34 40 27 42 -04 -08 01 -05 09 23 16 40 09 29 24
39	Emotional Adjustment	07 02 08 06 02 06 03 02 04 03 -01 16 -04 -03 03 01 09 -06 10 06 21 02 02 12 36 -16 -05 -01 02 33 -01 -28 29 -04 31 -23 -03 09
40	Goal X - Total	35 07 25 34 14 31 34 19 14 19 20 15 26 21 17 36 39 30 33 38 32 41 35 39 35 42 -03 -07 -06 00 05 18 17 34 23 31 56 81 35
NUMBER	NAME	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

NOTE: All correlation coefficients have been rounded to two decimal places and the leading decimal points have been omitted.

TABLE 53 CORRELATION MATRIX BETWEEN EQAI SCALES AND SUBSCALES (Grade 9)

NUMBER	NAME	SUB AND TOTAL SCALES
1	Home Climate	
2	Social Desirability	20
3	Self Confidence	50 13
4	Control of Environment	36 17 50
5	Relations with Others	24 13 54 35
6	Image in School	41 16 54 48 45
7	Goal I - Total	49 18 84 72 74 81
8	Race Tolerance	02 12 04 20 12 14 16
9	Religion Tolerance	04 14 07 19 14 18 18 45
10	SES Tolerance	06 16 06 18 14 12 15 49 41
11	IQ Tolerance	07 17 02 21 10 10 13 39 30 49
12	Handicap Tolerance	07 19 04 23 12 13 07 39 30 43 46
13	Goal II - Total	08 21 06 27 17 19 23 77 69 75 71 56
14	Goal III - Verbal	12 -11 14 33 10 24 26 20 22 09 12 08 21
15	Goal III - Math	09 -12 13 30 08 22 20 17 17 06 09 14 12 66
16	Learning Attitude	24 19 19 37 10 36 37 22 20 22 25 26 32 22 17
17	School Attitude	33 10 25 40 14 43 31 18 13 16 21 27 21 24 23 66
18	Goal IV - Total	32 15 04 42 14 43 40 22 18 20 25 21 33 26 19 88 89
19	Welfare / Dignity of Others	17 14 09 27 07 20 19 31 24 27 28 31 32 20 17 35 35 37
20	Law and Authority	25 14 12 27 -02 23 19 20 11 19 24 23 26 14 13 39 42 44 62
21	Responsibility / Integrity	17 14 07 23 -00 18 12 23 15 24 25 33 25 10 11 35 41 30 62 65
22	Goal V - Total	23 17 10 30 02 24 21 28 19 27 29 25 38 17 13 43 43 49 31 90 79
23	Personal Health	21 16 13 23 03 16 18 12 07 14 16 16 19 10 08 36 31 38 46 51 41 56
24	Safety	23 15 16 27 03 19 19 17 15 16 21 24 24 18 15 34 38 38 43 54 42 52 51
25	Drugs	29 06 20 29 02 22 21 13 07 11 13 20 13 23 24 33 43 31 37 46 45 37 35 53
26	Goal VI - Total	29 14 19 32 03 22 25 17 13 17 21 17 27 23 19 41 41 48 50 60 42 64 21 80 61
27	Visual Arts	-01 09 03 -02 04 06 04 05 03 03 04 04 06 -10 -09 12 04 07 03 06 09 07 03 01 -03 01
28	Performing Arts	-03 16 02 -05 09 06 04 04 01 02 03 04 03 -18 -18 10 01 03 02 03 08 03 00 -01 -06 -07 63
29	Science	-00 09 05 -03 03 09 04 -01 -02 -06 -09 -00 -05 -13 -11 11 01 03 -01 02 05 01 02 -05 -04 -10 59 62
30	Writing	01 10 03 -00 06 11 05 07 03 04 03 12 02 -06 -03 14 11 00 08 06 21 03 -03 06 17 15 50 58 51
31	Goal VII - Total	-01 14 04 -01 08 11 07 06 03 03 04 06 07 -11 -10 16 04 10 04 06 08 08 03 -00 -04 -01 84 84 78 64
32	Vocational Attitude	13 05 21 37 15 22 31 16 14 12 14 09 22 24 19 25 25 33 21 19 09 26 24 20 10 38 -00 -09 -10 -24 -02
33	Vocational Knowledge	14 -08 16 32 09 21 24 16 16 06 13 12 16 58 49 23 24 23 21 13 14 14 10 17 30 11 -10 -12 -03 [illegible] 10 13
34	Valuing	21 06 20 38 18 31 33 32 26 27 28 25 39 33 24 47 44 51 39 36 34 43 27 34 24 36 08 03 02 08 07 [illegible] 32
35	Receiving	16 13 09 21 10 25 20 23 20 24 26 25 32 11 07 46 38 40 33 33 39 35 22 26 28 15 22 21 14 37 26 -04 23 57
36	Goal IX - Total	19 11 14 32 14 29 28 31 26 29 31 25 42 26 18 51 43 54 39 37 33 47 30 30 19 42 18 11 02 03 19 30 15 83 74
37	Effective Solutions	21 08 13 24 08 21 21 13 07 16 19 18 17 08 06 40 40 41 27 34 32 36 28 24 27 28 04 03 02 07 04 14 14 28 31 29
38	Ineffective Solutions	32 11 23 33 08 24 27 20 18 19 18 18 25 25 20 35 42 43 36 41 36 45 36 46 35 48 -05 -09 -03 -06 -08 25 19 41 17 34 25
39	Emotional Adjustment	08 06 09 04 01 06 05 01 03 01 -02 07 -01 -02 -00 03 06 -02 06 04 15 00 -02 06 25 -15 -01 00 03 29 00 -24 20 -03 24 -20 -01 07
40	Goal X - Total	33 14 24 35 09 28 31 20 16 20 20 21 26 21 16 42 46 46 38 43 41 47 36 40 38 46 -02 -07 -04 -01 -04 22 21 37 27 35 59 81 33
NUMBER	NAME	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

TABLE 54

GRADE 7 ***SAMPLE*** SPRING 1973

THE ROTATED MATRIX OF FACTOR LOADINGS

		FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7
SCCDES	1	0.10785	0.09698	0.24531	0.15842	0.06117	0.46576	-0.10214
SELFCCNF	2	0.08228	-0.02477	0.84320	-0.00595	0.00662	-0.02864	-0.07153
CCNTLENV	3	0.21282	-0.06142	0.64375	0.12909	-0.05866	-0.25673	-0.26730
RELATE	4	-0.02005	0.06811	0.75796	0.07607	-0.00319	0.00897	0.01874
SHLIMAGE	5	0.13058	0.05674	0.67599	0.07617	0.02792	-0.03414	-0.33972
RACE	6	0.13697	0.03670	0.03622	0.71074	-0.06218	-0.11662	0.02048
RELIGN	7	0.07002	0.07754	0.10932	0.67263	0.00232	-0.08657	0.02727
SES	8	0.04368	-0.04216	0.05558	0.73639	-0.02612	0.04694	-0.17695
IQ	9	0.17150	-0.03739	-0.00501	0.64515	-0.04758	0.03249	-0.20583
HANDCP	10	0.12303	-0.04179	0.06372	0.57846	0.24838	-0.05636	-0.22782
GCAL3V	11	0.17434	-0.13989	0.14679	0.12684	-0.15805	-0.76317	-0.07760
GCAL3M	12	0.15331	-0.13083	0.12420	0.12527	-0.04451	-0.77811	-0.09841
LEARN	13	0.20372	0.07888	0.17533	0.11096	-0.07576	-0.02555	-0.75695
SCHCCL	14	0.27010	-0.00687	0.22527	0.08804	0.05452	-0.13283	-0.73107
WELFCTHR	15	0.76165	0.03143	0.02899	0.25054	0.03843	-0.11365	-0.08374
LAWAUTH	16	0.82610	-0.03427	0.02018	0.08974	-0.02912	0.02544	-0.17644
RESPELTY	17	0.68612	0.06285	-0.01368	0.15812	0.27138	-0.02144	-0.20796
PERSHEAL	18	0.72301	0.01650	0.06295	0.04139	-0.14245	-0.03882	-0.14688
SAFETY	19	0.69107	-0.05377	0.11721	0.08226	0.03778	-0.10106	-0.17458
DRUGS	20	0.54235	-0.09149	0.16623	0.03109	0.35766	-0.31557	-0.13059
VISART	21	-0.01269	0.84395	0.01762	0.01260	-0.10485	0.12539	-0.02535
PERFART	22	-0.01909	0.84362	0.02310	0.03055	-0.01813	0.19903	-0.01166
SCIENCE	23	-0.01124	0.84018	0.00519	-0.04725	0.01531	0.03229	0.00975
WRITING	24	-0.00748	0.70941	0.02245	0.03905	0.46738	-0.00958	-0.10118
GCAL8A	25	0.20146	-0.02291	0.29714	0.08432	-0.62441	-0.22248	-0.08908
GCAL8B	26	0.12959	-0.04233	0.12514	0.07243	0.34791	-0.68187	-0.11628
VALUING	27	0.22026	0.05022	0.15598	0.21236	-0.05988	-0.31716	-0.56973
RECEIV	28	0.10711	0.17774	-0.00327	0.18685	0.45808	0.00101	-0.56757
EFFSCLN	29	0.22872	-0.06288	0.03753	0.08430	-0.05747	0.07223	-0.56113
INEFSCLN	30	0.45038	-0.04307	0.24112	0.09440	-0.11907	-0.12780	-0.26017
EMOTADJ	31	0.13886	0.00632	0.11215	0.00306	0.80954	-0.07221	0.06592

TABLE 55

GRADE 9 ***SAMPLE*** SPRING 1973

THE ROTATED MATRIX OF FACTOR LOADINGS

		FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7
SOCDES	1	0.20557	0.10994	0.30663	-0.26367	0.34930	0.05913	-0.03385
SELFCONF	2	0.11083	0.00675	0.83890	0.05746	-0.05810	0.01872	0.05807
CONTLENV	3	0.24091	-0.05500	0.61202	-0.15354	-0.26041	-0.10021	0.23751
RELATE	4	-0.09418	0.04920	0.77139	-0.15601	0.01046	-0.00044	0.00505
SHLIMAGE	5	0.11690	0.07326	0.70340	-0.05154	-0.14746	0.00027	0.29713
RACE	6	0.11061	0.04803	0.03774	-0.72709	-0.15910	-0.04805	0.05783
RELIGN	7	0.04958	0.02753	0.11728	-0.65811	-0.18269	-0.03507	-0.01353
SES	8	0.09719	-0.03317	0.06253	-0.76668	0.05156	-0.01640	0.10327
IQ	9	0.12902	-0.02923	0.00321	-0.68455	0.01400	-0.05102	0.20154
HANDCP	10	0.19474	0.00669	0.05553	-0.64458	0.01182	0.11576	0.15115
GOAL3V	11	0.11323	-0.08724	0.11305	-0.11671	-0.83891	-0.11200	0.07219
GOAL3M	12	0.11756	-0.07277	0.10184	-0.09416	-0.80313	-0.06470	0.01309
LEARN	13	0.29941	0.10604	0.16753	-0.14741	-0.09532	-0.08519	0.70402
SCHOOL	14	0.35796	-0.00875	0.24145	-0.06276	-0.14817	-0.01008	0.66212
WELFOTHR	15	0.68567	0.03672	0.01275	-0.30881	-0.09571	-0.01111	0.14641
LAWAUTH	16	0.79017	0.03880	0.00254	-0.11401	-0.00997	-0.03219	0.23136
RESPBLTY	17	0.69390	0.10049	-0.04126	-0.22371	-0.00156	0.16592	0.24444
PERSHEAL	18	0.71147	0.00896	0.06745	-0.03241	0.04941	-0.16534	0.13913
SAFETY	19	0.74782	-0.01691	0.09135	-0.09960	-0.08105	0.00645	0.10477
DRUGS	20	0.63146	-0.04823	0.12323	0.01177	-0.22892	0.32377	0.17251
VISART	21	0.01756	0.83784	0.00146	-0.03546	0.05396	-0.08753	0.05365
PERFART	22	-0.01520	0.85495	0.04188	-0.04316	0.15906	0.00418	0.03027
SCIENCE	23	-0.00231	0.83033	0.04036	0.07431	0.03702	-0.00668	0.01395
WRITING	24	0.03099	0.72238	0.01938	-0.05800	-0.04417	0.44923	0.12388
GOAL8A	25	0.23703	-0.08247	0.26738	-0.09857	-0.17817	-0.61757	0.08977
GOAL8B	26	0.10691	-0.03717	0.11816	-0.08395	-0.74372	0.20687	0.15972
VALUING	27	0.23213	0.06385	0.12602	-0.28804	-0.28323	-0.11818	0.57674
RECEIV	28	0.16219	0.24010	0.02038	-0.26613	-0.06929	0.32342	0.63693
EFFSOLN	29	0.23940	-0.02560	0.06371	-0.04821	0.06226	-0.03736	0.63540
INEFSOLN	30	0.54082	-0.09737	0.19315	-0.10843	-0.15848	-0.10770	0.20665
EMOTADJ	31	0.10455	-0.00226	0.10796	-0.00701	-0.06206	0.81184	-0.01310

TABLE 56

Grade 7

SUM OF SQUARED ROTATED FACTOR LOADINGS

	SUM FOR EACH COLUMN	PERCENT OF TRACE
FACTOR 1	3.7399	12.06
FACTOR 2	2.7699	8.94
FACTOR 3	2.6045	8.40
FACTOR 4	2.5744	8.30
FACTOR 5	1.9650	6.34
FACTOR 6	2.3422	7.56
FACTOR 7	2.6693	8.61

Grade 9

SUM OF SQUARED ROTATED FACTOR LOADINGS

	SUM FOR EACH COLUMN	PERCENT OF TRACE
FACTOR 1	4.0085	12.93
FACTOR 2	2.7921	9.01
FACTOR 3	2.5823	8.33
FACTOR 4	2.9714	9.59
FACTOR 5	2.4615	7.94
FACTOR 6	1.6431	5.30
FACTOR 7	2.5989	8.38

TABLE 57

VARIMAX ROTATION

GRADE 7 ***SAMPLE*** SPRING 1973

ROTATION OF FIRST 7 FACTORS

COMMUNALITIES

SOCDES	1	0.33742	IQ	9	0.49273	RESPBLTY	17	0.61725	GOAL8A	25	0.58384
SELFCONF	2	0.72439	HANDCP	10	0.47233	PERSHEAL	18	0.57206	GOAL8B	26	0.63899
CONTLENV	3	0.62094	GOAL3V	11	0.70103	SAFETY	19	0.54309	VALUING	27	0.54523
RELATE	4	0.58577	GOAL3M	12	0.68886	DRUGS	20	0.57568	RECEIV	28	0.60597
SHLIMAGE	5	0.60039	LEARN	13	0.67014	VISART	21	0.74024	EFFSOLN	29	0.38817
RACE	6	0.54446	SCHOOL	14	0.68658	PERFART	22	0.75360	INEFSOLN	30	0.36555
RELIGN	7	0.48355	WELFOTHR	15	0.66611	SCIENCE	23	0.70966	EMOTADJ	31	0.65683
SES	8	0.58324	LAWAUTH	16	0.72471	WRITING	24	0.73412			

VARIMAX ROTATION

GRADE 9 ***SAMPLE*** SPRING 1973

ROTATION OF FIRST 7 FACTORS

COMMUNALITIES

SOCDES	1	0.34454	IQ	9	0.52953	RESPBLTY	17	0.63063	GOAL8A	25	0.56539
SELFCONF	2	0.72648	HANDCP	10	0.49292	PERSHEAL	18	0.56101	GOAL8B	26	0.65525
CONTLENV	3	0.59348	GOAL3V	11	0.76835	SAFETY	19	0.59538	VALUING	27	0.58362
RELATE	4	0.63080	GOAL3M	12	0.68773	DRUGS	20	0.60339	RECEIV	28	0.67028
SHLIMAGE	5	0.62650	LEARN	13	0.66268	VISART	21	0.71700	EFFSOLN	29	0.47335
RACE	6	0.57558	SCHOOL	14	0.65090	PERFART	22	0.76103	INEFSOLN	30	0.43045
RELIGN	7	0.48487	WELFOTHR	15	0.59774	SCIENCE	23	0.69821	EMOTADJ	31	0.68574
SES	8	0.61585	LAWAUTH	16	0.69354	WRITING	24	0.74564			

APPENDIX

Measurement and Statistical Terms

In this appendix we define the statistical terms and measurement concepts basic to the interpretation of the technical characteristics associated with each EQAI scale.

Mean

A mean score is the arithmetic average of a set of scores. The mean is computed by adding all of the scores and dividing by the sum by the number of scores.

Standard Deviation

This statistic gives information about the spread or dispersion among a group of scores. Typically about two-thirds of the scores will be found within one standard deviation above and below the mean and over 99 per cent will be found within three standard deviations above or below the mean.

Skewness

This statistic gives information about the symmetry of a group of scores. This coefficient has both direction (plus or minus) and magnitude. If the distribution of scores is perfectly symmetrical such that for every score a certain distance above the mean there can be found a score which is the same distance below the mean the skewness coefficient will be 0.0. In a nonsymmetrical distribution which is negatively skewed there are more scores at the higher end of the distribution and fewer at the low end. The converse is true of positively skewed distributions.

In reference to the skewness coefficients presented for each scale in Section Two, values ranging from -.11 to +.11 indicate that the distribution is symmetrical. Values outside this range indicate the distribution is skewed in the direction of the coefficient's sign.

Kurtosis

This statistic indicates whether the score distribution is *"flatter"* or *"more peaked"* than a normal bell-shaped curve. Negative coefficients show the distribution to be flatter than the normal curve while positive coefficients show the distribution to be more peaked. Kurtosis coefficients ranging between -.65 to +.65 indicate the distribution is essentially normal.

Correlation

This coefficient shows the degree and direction of linear association between paired variables. Correlation coefficients range from 0.00 to 1.00 and can be plus or minus. A zero correlation means that scores on the first variable are not linearly related to scores on the second variable. A correlation of +1.00 or -1.00 are perfect correlations. Knowledge of scores from one variable give perfectly accurate information about the relative position of scores on the other variable.

The sign of this coefficient shows the direction of the relationship. The correlation between height and weight is an example of a positive correlation – in general taller people weigh more than shorter people. An example of a negative correlation is one between amount of formal education and tendency to be unemployed – in general the more education one has the less likely one will be unemployed.

Readability Level: Gunning-Fog Index

Because all EQAI scales are of the pencil-and-paper type it is important to insure that the vast majority of students have the necessary verbal skills to understand what is being asked. Although it is impossible to control the range of verbal achievement in a large testing program it is feasible to write scales that require minimum reading levels. Section One discussed the initial precautions taken to insure readability. After each scale was finalized, its readability level was estimated by the Gunning-Fog formula. This formula takes into consideration both the average number of sentences and the percentage of three-or-more syllable words contained in 100 words. The index derived from this formula is expressed in *"grade level"* terms. Thus if the index is 5.0 the scale should be understood by the average 5th grade student just entering 5th grade.

Reliability

Reliability is that characteristic of a measuring instrument which deals with consistency of results – either over time (stability) or within the scale itself (internal consistency). Reliability coefficients are reported as two-place decimal figures ranging from .00 to 1.00. As the instrument increases in reliability the coefficient increases in value.

Reliability coefficients can be interpreted as the proportion of the variance in a set of scores which is caused by variation in the examinee's true scores, rather than by errors of measurement. They can be estimated either from a single form of a test or from two parallel forms. When estimated using a single form of the test they are called internal consistency reliabilities.

These coefficients were computed for all EQAI scales. The coefficients are derived by taking into account the length of the test and the extent to which test items contribute mutually confirming or consistent information. The KR-20 reliability formula was used for the knowledge scales socred on a *"right vs. wrong"* basis. For the attitude scales both the coefficient alpha and Guttman's Lambda-3 were used to obtain internal consistency estimates. The latter is less affected by adverse factors such as negative inter-item correlations.

Internal-consistency reliabilities based on criterion-referenced scoring of the scales were also obtained using Livingston's[1] Formula. As the magnitude of these coefficients increases we can be more confident that errors of measurement are unlikely to make a difference between meeting or not meeting the criterion for many of the examinees.

Standard Error of Measurement

This statistic suggests a range within which an individual's true score would exist. One standard error of measurement on either side of the obtained score would suggest that two times out of three the individual's true score would fall within that range. As a rule of thumb, the standard error of measurement for the total score should not exceed 50 per cent of the magnitude of the standard deviation.

Difficulty Level

This term applies to tests which are scored on a right-wrong basis. The difficulty level of a test is expressed by the average per cent of the items answered correctly by the group taking the test.

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[1] Livingston, Samuel A. *Criterion Referenced Applications of Classical Test Theory Journal of Educational Measurement*, Volume 9, No. 1, Spring 1972, pp. 13-25.